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[OFFICIAL NOTICE.]

Annual Meeting of the Western Gas Association.

SECRETARY'S OFFICE, WESTERN GAS ASSOCIATION,
QUINCY, ILLS., March 22d, 1884.

It is with extreme gratification that I inform the members of our Association that the prospects of a successful meeting at St. Louis are brightening day by day, and are now as promising as one could wish. That the attendance will be unprecedentedly large you can all rest assured. Our last meeting, at Cincinnati, Ohio, was characterized by additions to our membership which were as surprising as they certainly were gratifying. The St. Louis meeting will be no less distinguished in this important respect. The great Northwest has done, and is doing, all in this particular that could be reasonably asked. The "Ohio Man," as you cannot fail to remember, did nobly at Cincinnati, and rallied to our support with the enthusiastic unanimity that distinguishes the citizens of that prosperous State. We shall look for him again at St. Louis, and he tells me that we shall not look in vain. Illinois, Iowa, and Indiana did nearly as well; but I wish to address an especial appeal to the gas engineers of the South and Southwest, who are included in the broad domain of our territory. Our title is, as you are all aware, the *Western* Gas Association; but we extend cordial greetings and a brotherly welcome to the gas fraternity of the Union. The member from the Land of Cotton will be as warmly welcomed as his fellow-worker from the ice-clad regions of the North—and let us not forget our brethren from the East. Last year our meeting was cheered and enlivened by their presence to such an extent that we now feel emboldened to demand their kindly co-operation. Gentlemen of the New England and American Associations, we extend to you the right hand of fellowship, and both hands if necessary! Come and meet with us, and those of our number who can will take pleasure in returning your friendly visit in the near future.

I again wish to impress upon our members the importance—I may say the absolute necessity—of a liberal presentation of papers, and I rely upon you for the faithful performance of this work. You still have ample time in which to prepare; but you will recognize the advisability of making a beginning at once. Do not fail us, I beg of you, or the Seventh Annual Meeting of the Western Gas Association, which now bids so fair to be the most signally successful of any that has ever been held, will fall far short of our expectations. Trust not to your fellow-member for the performance of a duty which you yourself should render.

In this connection I may state that I have been especially requested to solicit the presentation of one or more papers on the management of small works. Many of our members are superintendents of works of limited capacity; and it is for their benefit and instruction that this appeal, which I trust will be heeded, is made.

The Southern Hotel, than which there is none better in the West, has already been selected for our meeting by the Committee of Arrangements. The proprietors of the hotel have agreed to furnish outside rooms at the rate of $3.50 per day, while interior rooms will be offered at $3 per day. These figures show liberal concessions from the regular rates charged at the "Southern." I will take pleasure in securing rooms beforehand for all those who take the trouble to notify me of the sort of accommodation desired. Hoping to see you, one and all, on the 14th, 15th, and 16th days of May, I am,

Yours obediently,

A. W. LITTLETON, Secretary.

ALWAYS TELL THE TRUTH.

In the closing argument made by the Hon. Robert M. Morse, Jr., in advancing reasons why the Committee on Manufactures of the Massachusetts State Legislature should report favorably on the matter of amending the laws governing the sale of gases containing a certain percentage of carbonic oxide, we find the following:

"We have had, for instance, Mr. Thomas, of Brooklyn, a man who *lost* his position in connection with the coal gas company of Brooklyn when that company determined to sell water gas. Irritated by the loss of his position, he has come on here, etc." A little further on, in the same precious oration, we are informed, "* * Mr. Thomas is a man who has lost his place by reason of the advancing tide of reform and innovation. * * * Mr. Thomas, irritated at the loss of his place, has come on here to vent his spleen on the water gas people."

It is not the course usually pursued by the management of this JOURNAL to pay any attention to personal attacks made upon it, and the JOURNAL never publishes a statement founded on malice. If "old-fogyism" means the enunciation of principles honestly believed in and earnestly announced, then those who control the policy of the JOURNAL are old fogies first, last, and all the time. The quotations from the palaver of Mr. Morse given above are fair average samples of the truthfulness of the entire argument; and we must ask our readers to pardon us for having even reproduced these. Mr. Joseph R. Thomas, entirely of his own volition, handed in his resignation to the Board of Directors of the Williamsburgh Gas Light Company on the 29th day of October, 1883, and the resignation was not accepted until the 15th day of the following month. The resignation was made simply because Mr. Thomas could no longer continue in relations with people whom he could not respect nor willingly serve. Mr. Thomas's reasons for visiting Boston were only such as serve to guide all old fogies who desire to uphold, by honest, straightforward methods, that which they consider to be equitable, right, and just.

A NEW FEATURE IN THE JOURNAL.

We have been fortunate enough to secure the services of Mr. Norton H. Humphrys as a special correspondent to the columns of the JOURNAL. Mr. Humphrys is a fluent, forcible writer, and states plainly what he means, so that "he who runs may read." The gentleman is widely known in European gas circles from his scholarly articles on topics connected with the industry which will continue in the future, as it has in the past, to furnish the world's foremost illuminant. Our English correspondence will appear in the first issue of each month, and the initial letter is given with this number. We call the attention of our readers to the budget of news contained therein, and are confident that those who wish to keep themselves posted on what is transpiring among our trans-Atlantic fraternity will hereafter look up Mr. Humphrey's future communications without further invitation.

LIGHTING NEW YORK CITY.

The bids for lighting the public buildings and street lamps of New York city were opened by the Gas Commission on Friday, March 21. The bids given show no perceptible difference from those of a year ago. The United States and the Brush Electric Light Companies are on hand once more; and, despite all the talk indulged in during the past twelve months by the promoters of "the light of the future," concerning the wonderful devices discovered whereby electric installation and maintenance charges were to be reduced fully one-half, smilingly ask a renewal of their respective contracts at the old price of 70 cents per light per night. The United States Company bid for 282 lamps, and the Brush Company figured on 475, or precisely the same number supplied by them during 1883. These 757 arc lights cost the city the neat sum of $193,413.50 per annum, and the territory illuminated is insignificant when compared with the total area to be lighted. The chief characteristics of the arc luminary in this city differ in no wise from those which distinguish it in other places. The evening papers of last night (March 26) mention that, "owing to an accident to the steam chest of the engine in the Elizabeth street station of the Brush Electric Light Company last evening, Fifth avenue, from Twenty-third to Thirty-fourth street, was left in total darkness. During the night the damage was repaired." This is only one of the many "eclipses" that might be mentioned; indeed, it is matter for wonder when the arc system manages to shine steadily through the night. There does not appear to be much of a disposition on the part of the authorities to extend electric street lighting in New York city; and certainly the electric lighting people themselves do not seem over-anxious to increase the magnitude of their operations in this particular branch of the business. All of which, no doubt, must be matter for congratulation on the part of the taxpayers.

When the bids were read the Commission laid the whole matter over for further consideration, and we presume final action will be taken some time during the present month.

A Despondent Electrician.

Mr. William H. Preece, Electrician to the Postal Department of England, seems to have reached a state midway between wrath and despair, and once more appears in print as the author of a paper on the "Progress of Electric Lighting." The London *Journal*, in a note upon the subject, says that "Mr. Preece began well by separating financial success from technical progress," and adds the following:

"None but an electrician could use this sentence; 'The progress of electric lighting, from a financial point of view, has been disgraced by the commission of every possible crime that commercial immorality could invent, and every foolish act to which insane speculative mania could lay itself open.' When perusing these vigorous words, it is impossible to avoid wondering whether in this respect Mr. Preece speaks as one wise after the event, or whether he entertained convictions of the same kind two years ago; and, if the latter, why he did not raise his voice when it might have done some service. Mr. Preece further distinguishes himself by saying that the Electric Lighting Act of 1882 "strangled the babe" of electrical supply; by which he seems to imply that the Board of Trade have been nearly as wicked as the speculators in their dealings with the nascent movement. In speaking of practical matters Mr. Preece is not very consistent, for in most points of detail he confesses that the progress made during the past two years 'has not been very marked;' while he evidently wishes to create a general impression that great things have been done somewhere. In one respect we are disposed to agree with Mr. Preece—when he concludes his entertaining, but somewhat hollow paper, by protesting against all attempts to compare the cost of gas with that of electric lighting. He says, in short, that people who can afford it will have electric lamps; whatever they may cost in comparison with gas. They are a luxury which must be paid for. Quite so; but this is scarcely the view that was taken by electricians two or three years ago. They have been driven to this method of argument by the stern logic of facts. First contending that electric lighting must become universal, because it was cheaper than gas, they now argue that it does not matter how the question of cost stands. They are welcome to as much comfort as they can draw from this way of looking at the competition between the two luminants."

The Petroleum Outlook.

Stowell's *Petroleum Reporter*, under date of March 22, in reviewing the latest news of the situation, says that during the month of February there were no unusual features to be found in the course of the petroleum trade. The attention of the trade during the month has been principally confined to the Balltown and Cooper districts, the latter embracing the new Henry's Mill district. The new wells in all of these fields, however, have not shown themselves in anywise different from those previously brought in. Commencing with quite a gush, they fail to hold up their first production for any length of time, dwindling rapidly to small producers of from 5 to 20 barrels. The new wells of the Henry's Mills tract are, indeed, showing somewhat better, the production of the 19 wells of the district being placed at 3,000 barrels—an average of 150 barrels per day. The indications of greater activity in operations will be found in the well account, which shows an increase of 174 producing wells, as against 150 last month. Further down we find that the average daily production of the new wells has risen from 13 barrels to 16 barrels.

This new production has not been without its effect on prices, although there have been but few if any marked declines on account of the new fields. It is true that after holding quite steady all the first half of February, the market dropped pretty decidedly about the middle of the month, just as one of the Porter wells increased its production largely; but whether the cause of the decline may be found in this "bear," which was very short lived, or whether it was caused by the drop in refined which took place at that time, or whether it came from the suspension of the endeavors of strong speculative influence to hold up prices, it is indeed difficult to say. In fact, viewing the course of the market throughout the month, the decline in question seems only an emphasized phase of the situation, the fall extending over the whole month, at a somewhat less rate of decline.

The prospect of advanced prices in the future is certainly not made brighter by the showing of the statistics for February. The well account, as has been already referred to, presents all the elements of at least a temporarily increasing production. The increase in stock, which commenced last December, still continues, and the daily average is much increased over last month. Add to this the extensive developments in Europe, which only recently have been fully appreciated, and the influence which these must have on shipments, and the weight pressing down on the market is seen to be heavy indeed. It is true that production, on account of the poor staying qualities of the wells which are now making the increase, may fall off again; but other influences, which of late have been much stronger than the field news, however encouraging or discouraging, still prevail, and it does not seem probable that the trade can escape their effect soon.

[Official Report.—Continued from page 128.]

Fourteenth Annual Meeting of the New England Association of Gas Engineers.

Held at Young's Hotel, Boston, Mass., Feb. 20 and 21, 1884.

First Day—Afternoon Session—Feb. 20.

Discussion on the Paper of Mr. Stiness.

The President—I do not believe that the Association wishes to pass to any other business until we have considered and discussed the paper to which we have just listened. I see one or two gentlemen present who have had considerable experience with the Dieterich furnace. I will ask one of the gentlemen, to whom we are always glad to listen, to give us an account of his experience during the past year with the Dieterich system. The gentleman to whom I allude is Mr. Armington, of Brooklyn.

Mr. Armington—I would be very glad indeed to make any remarks which would interest the gentlemen present, but I do not think that my experience in that line has been sufficient to warrant my saying much about the Dieterich furnace. I was unavoidably absent from the room when the paper (which I should have been very glad to have heard) was read. Had I listened to the paper I think it would have called out some ideas which now lie dormant. I can only say (and it is a reiteration of what I commenced saying some four or five years ago) that I think the old plan of burning fuel is a barbarous one. The more I read upon the subject, and the more I practice, and the more I hear from others about it, the better satisfied I am that those remarks were timely, and that we are all sure to wake up to the importance of the subject. I know that so far as you, Mr. President, are concerned, you have already tried many experiments in that line. Most of the gas engineers in the country, however, have not. Some of us have had a very painful experience, and some of us have had a very pleasant experience. I think that all of us have suffered more or less from all sorts of furnaces—from those that have been named as well as others. But every day we are finding out better and better how to take care of them, how to economize the fuel, and how to save a good many of the hard words that heretofore we made use of. So far as my experience upon the subject, in the works with which I am connected, has gone, I shall simply say that, from season to season, we are working out all the old furnaces we had, and are working in some of the Dieterich furnaces and some of our own, and now propose to try still another. I wish that I could speak definitely to you upon the subject, but I cannot. I can simply say this: my experience has been that with this furnace we save a vast amount of fuel; we get better and more even heats; but still at our works we have never been able to arrive at results such as have been detailed by some of the members. What we may be able to do one of these days I cannot say. While speaking, I would like to move that the thanks of the Association be tendered to Mr. Stiness for his paper.

The motion was carried.

The President—I will call upon another member present to express his opinion upon this subject. There is nothing more valuable in the discussion of these various matters than a statement of the experience of those who have had misfortunes. They have usually worked out of their misfortune a good measure of success. We would like to hear from Mr. Cushing, of Lowell, Mass., respecting his experience with the Dieterich furnace.

Mr. Cushing—I have used the furnace for only a limited time. I may say that my experience with it has only just begun, and I am finding out some new things about it every day. I expect, when I have all my benches heated with this or some analogous kind of furnace, that I shall be able to make a report worth listening to. At present I can say that the Dieterich system effects a great saving in fuel.

Mr. Armington—Pardon me, Mr. President, but while this subject of furnaces is under discussion I wish to call upon a gentleman who has made a great many figures heretofore in connection with this topic; and I think that our friend Stiness referred to him in his address. From some papers which he sent me a short time ago—I do not know whether I wrote to him about them or not, but if I did not I wish now to express my feelings toward him, and my sentiments in regard to the subject of his communication, by saying that I think, if he keeps on in the way he has commenced (and I have no doubt he will), he can demonstrate to us that he can do what the Irishman desired when he said that if he only had another stove he would save all his fuel. I am certain that Mr. Stedman knows all about furnaces, and I hope he will tell us his experience.

Mr. Stedman—It is very singular that my friend Mr. Armington is always around after the dinner is finished. If he had been in the room a little sooner he would have heard what I had to say upon that subject, as the subject of these generator furnaces was brought up very prominently by the paper read upon that subject by Mr. Nettleton. I then had the pleasure of rehearsing to some extent what I had said to the American Association last fall. I will take Mr. Armington in private and tell it all to him later; but I will not bore the Association with it again. I wish to say, however, that I feel specially grateful to my friend from Pawtucket for his paper, because I think it is an admirably practical paper. He has works there which are really worth seeing, and if any member of the Association has not had the pleasure of visiting them, I assure him that it will be well worth his while, not only to see what Mr. Stiness has to show him there, but also to test his sense of Rhode Island hospitality.

In his paper he alluded to one subject, in connection with this topic, at greater length than I supposed he would; and that is the hydraulic main, which has been of late interesting me somewhat. I think that we all have more or less trouble with the hydraulic main, in connection with very high heats. It would open a very ample field for discussion if different experiences with hydraulic mains were given here. I am not aware that any very wide departure has heretofore been made from the old traditional D-shaped vessels with the tar outlet on the end, and the dip-pipe in the main. What we want to arrive at is a theoretically perfect hydraulic main, one that shall work effectually with the least possible resistance; and, in my opinion, that will be one which, while it leaves the water, or the very lightest liquid, in the main, would be able to discharge automatically, and without attention, the heavy fluids; and discharge them not only automatically, but continuously, so that, as soon as the tar was condensed in the main, it could be removed before it had any chance to solidify. I do not know exactly how that could be effected, but it seems as if this were one step towards it, by having the main deeper at one end than at the other, so that the tar can move along to the deep end and be discharged from thence, leaving the lighter fluids in the main over the seal. I saw recently, in an English paper, the figure of a main which was brought out there a short time ago. It seems to be divided into sections corresponding with the benches over which it stood, and had a separate tar outlet for each section. I think there is some virtue in that, because at any time you could quite effectually seal any bench which happened to be out of action at the time; and also because the tar could be removed from the hydraulic main before it got cool. In the plan of the hydraulic main which has been shown us, if the fire happens to be towards the higher end of the main, and the tar has to be removed from the further end of the main, under which there were no fires, it is just possible that the tar would become pretty thick in cooling, and, while moving slowly towards the cold end of the main, would offer some resistance to an easy discharge at the lower end. I think if we could get a main which would leave nothing for the seal but the light liquids, and which would offer scarcely any resistance to the outflow of the gas from the dip-pipes, we would hardly need to unseal that. If the pipes were made level on the bottom, and were sealed with a half inch of fluid, such seal would be perfectly effectual, at least while the bench was in operation. It might be advisable, while the bench was left off, for safety, in the event of a possible settlement of any particular section of the main, to seal that particular section of the main more deeply. I think that a good many of us have experienced the great danger arising from gas escaping into a bench, which was not itself under fire, but which was contiguous to a bench which was in operation. I have had one or two pretty loud reports occasioned from difficulties of that kind. Therefore, it seems to me that it would be advisable that our main should be sealed, and that the dip-pipes should be sealed with more than ordinary care when that section is out of action. At the same time it is desirable, of course, to have the lightest possible seal on the dip-pipes which are in action. The experience of Mr. Stiness, in the collection of soot at the end of the dip-pipes, causing an obstruction in the stand-pipes, is one that is pretty general, so far as I can learn. At least, we have had that same experience, and, in fact, have always found, when the stand-pipes persistently stopped up, such stoppages were owing to the difficulty with which the gas disengaged itself from the dip-pipe in the hydraulic main; and we found a remedy for the stoppage of the gas in the stand-pipes by removing the resistance end of the corresponding dip-pipe. So that I am quite convinced if there were a very light seal on the end of the dip-pipe, and that seal could be maintained at the very lightest possible point consistent with safety, and with the hydraulic main so arranged that no accumulation of heavy tar, or soot and pitch, could gather around the dip-pipes, we should be practically rid of our trouble from stopped stand-pipes. I believe, therefore, that any advancement we can make in perfecting the hydraulic main is an advancement towards the easy working of the retorts, and the getting rid of the difficulties which we experience from stopped stand-pipes.

Mr. Stiness—The plan which I have adopted is one for three sections of 27 feet, which would be the extent; and, in the experience which I stated, with the condenser, all the tar must flow to the outlet. The dip-pipes are level; the water is maintained at an unvarying level; and there can be nothing at the outlet, but water and the lighter fluids, which would prevent the tar from flowing there. In regard to the other experiment which I have tried, its solution, of course, requires a little labor. But I think, if any member of the Association will try it, he will find that, with a level main,

there must always be the same thickness of tar the whole length of the main as there is at the overflow. If the seal is 6 inches from the bottom of the main, the water flows off and the tar remains. Therefore the gas must pass down through this thick sold tar. If the tar were allowed to flow to the outlet, taking, in this case, of course, the bottom of the main to the outlet, and flowing up and over, and changing the seal, as I propose to do, all of the tar must flow up and flow over. In regard to the other experiment—by taking a barrel and placing it at the end of the main, I have drawn every particle of tar from my main in two days; and have had nothing left but the water. You simply take one barrel of tar out of the main. In my particular case, while that tar was being drawn out, the stop-cock not being turned, there was a deposit of tar and water sufficient to make up for the taking out of that barrel of tar from the main. Water flows in at first, but tar will after wards flow. Leave it for the night; your main is perfectly sealed; there is no outlet from the tank unless somebody should open the valves; and in the morning you will find a barrel of thick tar. Repeat that operation, and you can draw every particle of the thick tar from the main and have only liquid or water remaining. I have in my own case paid a great deal of attention, during the past five months, to determining, if possible, the cause of stopped stand-pipes. Situated as we are, with so many large mills, I can do anything in my retort house that I please. I can stop the whole works if I am compelled to stop. I have taken the hand plates off of the hydraulic main repeatedly, and examined them. We have always found 6 to 7 inches of tar in the bottom of the main. The question presented itself to me—is there no way in which I can get that thick tar out of the main, and leave nothing there to seal but water? Having built a condenser box on that same plan, I commenced an examination of the vessel and found that there was nothing in the condenser but water, the tar being all at the outlet. I like to have the main in sections. If you are running high heats you will have a sticky tar having no inclination to run from the main, and you must get it out in some way. My belief is that as soon as tar is deposited in the bottom of the main it must find its way to an outlet, or you must devise measures to get rid of it in some manner.

Mr. Lamson—Did Mr. Stiness make any experiment with three hour charges, and, if so, with what result; and does he still continue to use them?

Mr. Stiness—I did make some experiments. When we first commenced working the Dieterich furnace we made some experiments with three hour charges, but did not meet with that amount of success which we had hoped. Our experience in running three hour charges was not satisfactory, owing, I suppose, to certain peculiar conditions under which we were laboring. I found that when running three hour charges I was compelled to employ lighter charges, and did not get any greater yield from the mouth piece, or per bench, or per pound of coal. Still, as I say, I have only run the bench for a period of six months. During that period of time it has been a perfect success. Our good friend, Nettleton, says, in the first year that he tried them, he did not meet with success. I was, perhaps, more fortunate. Taking our experience in the working of our retorts under the old system of firing and comparing the results with those obtained at the present time, they are, to me, a very decided success. Speaking to one of the foremen of my retort house yesterday morning, and asking him with regard to the dark weather that was coming on, I said, in view of the fact that we dropped a fire the previous Saturday, "You must give the retorts all that they can swing to this week." He replied, "Mr. Stiness, I think I could make 15,000 feet per retort, if I could get the coal into them."

There is one other point which I would like to bring before the Association, and which I wish some member would investigate. We sometimes speak of the amount of air that is carried into the secondary air flues, and also of the heat. It has been to me a question, which I would like to have determined, what is the relative amount of air which is carried to the furnace and produces combustion. I have made some experiments (by taking a pipe, filling it with liquid ammonia, and vaporizing the ammonia) with a view to determine the relative pressure which you could obtain by vaporizing ammonia under steam at 60 pounds pressure. What I want to determine is whether the pressure by the vaporization of ammonia under different degress, produces a relative increase of power. I believe that if what you might term a cartridge, containing liquid ammonia, with a pressure-gauge that would record 5,000 pounds pressure, you could determine the intensity of the heat of the retorts by vaporizing the ammonia. I have looked into the matter somewhat. A friend of mine came to inspect my works a short time ago; while looking at my benches he asked what heat I was working them at. I told him I did not know, that it was beyond my arithmetic. What I wish to determine, in one particular point, is the temperature of the air that we introduce at the very point of combustion. That is a matter which is, I think, worth the investigating by those running the Dieterich furnace.

Mr. Lamson—You did run three hour charges to some extent, did you not?

Mr. Stiness—For about ten days.

Mr. Lamson—Did you get stoppages under that system?

Mr. Stiness—At that time we had only commenced with a new lot; everything was new, the hydraulic main was clear, and it was some three months before we had stopped stand-pipes which were an annoyance. We would then sometimes have two or three in a day.

Mr. Lamson—But that was not when you were running three hour charges.

Mr. Stiness—No.

Mr. Lamson—The benches were not heated.

Mr. Stiness—No; the benches were not heated. My working, given in the paper read to-day, dates from the 1st of September. Up to the 1st of December the benches were not doing all that they actually could accomplish.

Mr. Sherman—Without wishing to introduce the exciting subject of coke measurement before the meeting, I would like to ask Mr. Stiness by what standard he measured his coke, and was able to get 42 bushels to the ton.

The President—The subject of coke measurement is a favorite topic in these meetings; and I hope that Mr. Stiness will have an opportunity to answer Mr. Sherman's question.

Mr. Stedman—Before we enter upon that subject, I would like to refer to the subject under discussion a moment ago, with reference to ascertaining the heat of the in-going air in the recuperator or regenerative combustion. I confess my own inability to determine it, except by drawing the air out in some way and discharging a certain quantity of it in a known quantity of water, and determining in that way the quantity of heat which is carried in the air. The difficulty of measuring it in the flue is that you always have to take into consideration the radiant heat from the contiguous fires. As the air does not absorb radiant heat, and is only warmed by coming in contact with a solid substance, you have fatal error in your calculation if you introduce any solid body whatever in the air flue to ascertain the heat of the air. I should be very glad if some gentleman would suggest means by which the temperature of the air flues could be accurately ascertained.

Mr. Taber—I saw, in an English paper, an account of an electrical pyrometer. In the article it was said that it was possible to ascertain the temperature of retorts up to 2,200°. Perhaps some of the members of the Association may know of it. I have not myself looked it up, but it seems so plausible that I thought perhaps there might be something in it.

The President—I noticed the statement referred to by Mr. Taber, and was interested in it, but am sorry to say that I have no further information upon the subject.

Mr. Nettleton—I want to congratulate Mr. Stiness upon the progress he has made. It is certainly very pleasant for me to hear of a man who is succeeding so well as Mr. Stiness has done; and I am glad that he attributes his success so largely to the introduction of improved furnaces. I think that my friends in my own neighborhood, and particularly the managers of similar sized works, thought that I had made a mistake when I introduced this furnace, and for a time I did not know but that I had. But now, after having used it for three or four years, I should be very sorry to go back to the old method of firing; and I think that Mr. Stiness will say the same thing, after having used the furnace for five months. He has certainly done better than most of us who have tried the Dieterich furnace. He is making 1,000 feet of gas with 1.08 bushels of coke. It amounts to 12 bushels to the ton. The balance, on the basis of 42 bushels, will leave for sale 30 bushels. Allowing for the contraction of the pile, he will sell probably 26 bushels—which is much better than is usually done by the old methods of heating retorts.

Mr. Sherman—Have you figured the percentage by weight?

Mr. Nettleton—No; but it will amount to about 18 per cent., I think.

Mr. Stiness—I have not figured it.

Mr. Nettleton—The ease with which it is possible to get up the heat with these furnaces can hardly be appreciated until a person has had a furnace in his care. Lately I have been running three benches of fives. The consumption dropped to a point where I could get along with two benches, and so I dropped off two beñches. In 24 hours the retorts were each making over 8,000 feet where previously they had made but 6,000 feet, and the heat was increased by simply changing the air draughts, moving the slide and fastening it with a screw. It took only a few moments to make the change. The labor of the stokers was not increased a particle to obtain the increased heat. It has seemed to me, from Mr. Stedman's success in using furnaces, that there must be something radically wrong about the Dieterich furnace. The lowest percentage of fuel obtained in running any Dieterich furnace, on four hour charges, is 33 per cent., or about that. At Providence, they are able to get along with 24 per cent., which is probably due to the fact that they are using three hour charges. Mr. Stedman has worked that down to 18½ per cent. The difference in the construction of the furnaces is this: The Dieterich furnace is out in front of the bench; Mr. Stedman's furnace is back under the bench. I have always believed that a part of his success

is due to the fact that his coke is right in a position where all the heat that is evolved goes directly to the retorts. None of it is wasted on the throat that carries the carbonic oxide from the furnace in under the benches. Other gentlemen here, many of them, are very much better posted than myself on this subject, and I would like to hear an expression of opinion from them.

Mr. Stedman—I think (if I am not occupying too much of the time of the Association) that the recuperation is lost sight of in great degree. Of course, it makes a vast difference in the quantity of fuel used whether your escaping products from the bench are at 2,000° or at 1,000°. If any gentleman will figure up the amount of fuel which it will take to produce that difference, he will see where the possibility of a great saving of fuel arises. In the lower escape flues of our bench the heat is at a very dull red, scarcely perceptible in the day-time. We think, therefore, that we have utilized about 1,000° or 1,200° of heat which would otherwise have escaped up the chimney in the ordinary setting of regenerative furnaces, where recuperation is not employed to the extent that we use it. To be sure, in the first place, it costs something to build such a furnace; but I am of the opinion, as we construct them now, that the settings of the furnace proper, the recuperative part of the furnace, will out-last a great many settings of the retorts. I do not see that the one we have let down is at all damaged below the retort. I do not see why, with a moderate amount of heat on the lower part of the air flues, the waste heat flues shall need to have hardly any wear. Certainly they ought to last a great many years. If you figure up the theoretical heat to be obtained from a bushel of coke, and see what proportion of it goes out of the chimney, when the escaping heat, after it leaves the retorts, is perhaps 2,300°, or 2,400°, and no portion of that utilized again, and compare with that the utilization of 1,000° to 1,200°, you will see where the gain is. I believe the rule is that a dull red, which can be seen in the day-time, is between 900° and 1,000° of heat. It is possible that the heat in the lower flues may be between 1,000 to 1,200; it is certainly a very much lower temperature than the heat, as it ordinarily escapes from the bench, in which recuperation is not at all used.

Mr. Nettleton—I wish to call Mr. Stedman's attention to a fact in connection with what he says. Of course he is aware that in Europe they believe that recuperation makes a difference of only 2 per cent. by weight, or 3 per cent. by measure, of the coke; and in his working he makes a saving, over the working of the Dieterich furnace, of nearly 15 per cent., by measure. So that, if the authorities in Europe be correct, there is still a difference between the Dieterich furnace and his own of about 12 per cent.

Mr. Stedman—I have never seen the statement that the difference would be only 2 or 3 per cent. If you take the theoretical figures you will find it between 10 and 12. What the actual difference may be, between the different systems of recuperation, I do not know; but if you take it theoretically you will see that in saving 1,000° of heat in the ordinary combustion you are saving 10 or 12 per cent. of fuel.

Mr. Nettleton—I have seen that statement made. Mr. Greenough has been over there, and can probably tell us all about it.

The President—It seems to me that there is some verbal difference between you, gentlemen. My impression is that the difference in fuel which is estimated to be saved in Europe is 10 per cent., but not 10 pounds per hundred. For instance, where recuperation would save about 10 per cent. of the quantity of fuel used, and where the quantity of fuel used was 17 per cent., it would bring it down to about 15 per cent., which would be about 2 pounds per hundred. I think, therefore, that you, gentlemen, are both right.

Mr. Stedman—That is the idea I intended to convey—that it would save 10 per cent. of the amount of fuel used, and produce the same effect.

The President—But only 2 per cent. by weight, which is what Mr. Nettleton means.

Mr. Nettleton—Mr. Stedman must still allow that he is doing 12 per cent., by measure, better than is being done with the Dieterich furnace.

The President—Twelve per cent. by weight.

Mr. Nettleton—No, by measure. Allowing the Dieterich furnace, at best, to use 33 per cent. of the coke made, and Mr. Stedman uses but 18, the difference is 15 per cent., by measure, in his favor. By recuperation he saves 3 per cent. Suppose that he did not use recuperation, but merely used the regenerative process; then, instead of using 18 per cent., he would use 21 per cent.

Mr. Yorke—I should like to know the average amount of coke, in bushels, that can be economized by using the Dieterich furnace. I suppose that both Mr. Nettleton and Mr. Stiness have had sufficient experience to be able to give the information. How many bushels of coke per ton of coal carbonized can they sell?

Mr. Stiness—Mr. Sherman asked me that question. While the Guild of Gas Managers, perhaps, are not all of them infallible, nevertheless they advised and devised a common coke measure which was to hold two heaped bushels. Every member of that Association has had the measure made at one place, and every member of the Guild measures his coke by that standard measure. I have repeatedly made experiments in the weighing of the coal which was placed in the retorts, and have used the utmost care to have every particle of coke that came out measured. The amount sold depends in some measure upon how the coke is sold. If I could sell directly from the retorts I would be able to sell, I think, about 27 or 28 bushels. Mr. Isbell was at my place yesterday. He says that he has about four acres of land, and it is covered over by a coke pile. After that coke has been out all winter in the frost and storms, of course, he does not expect to sell any such quantity as he would if he could sell it directly from the mouthpiece of the retort. Therefore I think that the selling of coke, or the amount which you have to sell, depends a great deal upon the demand for it. The stand which I take about it is this: If you place a given quantity of coal in the retort, and that coal is withdrawn in the shape of coke, a part of which is placed in the furnace for fuel, the balance is what you have left for sale; but if you cannot sell it, if there be no demand for it, and the coke has to be piled up and handled over, it shrinks more or less. I think, in a majority of cases, the actual amount of coke sold, or made and ready to be sold, would not exceed 36 bushels, after taking out the waste. I am only giving you the figures as we have them, estimating upon the coke as it is taken direct from the mouthpiece; but when you come to the question of taking out the shrinkage and the wastage and the breakage, then you have perhaps 36 bushels to the ton of coal.

Mr. Armington—That is rank heresy.

Mr. Yorke—How many bushels would you have for sale in case you could sell it direct from the retorts?

Mr. Stiness—I think 27 or 28.

Mr. Yorke—Then you would have consumed at your works, for running the boiler and furnace fires, about 8 bushels of coke to the ton of coal carbonized.

Mr. Stiness—More than that, because we make 42 bushels.

Mr. Thomas—In the summer season, when all our coke was sold as fast as we made it, I found that the total quantity of coke used about our establishment, under the benches and the boilers, and for hoisting the coal, etc., amounted to about 40 per cent. by measurement. In the winter season, when the coke did not sell so readily, it amounted to 60 per cent. The question of interest here seems to be what quantity of coke can be gotten out of a ton of coal. Out of the Westmoreland coal you can get 42 bushels; but you cannot get such results from some of the West Virginia coals, nor can you get a like quantity out of the British Province coal. But you can take Westmoreland coal, and, day by day, get 42 bushels of coke out of it, according to the United States standard bushel. I have done it repeatedly, having made frequent trials, working with both large and small quantities, charging six and eight benches, seeing the coal weighed, watching every ounce of coke that came out, and seeing it measured. The West Virginia coal will, as a general thing, produce 34 or 36 bushels. If you mix the coals together you do not get 42 bushels of coke; but every day, and every time, you can get 42 bushels out of Westmoreland coal.

Mr. Stiness—There is one point with regard to the Dieterich furnace, in connection with the measuring of coke, to which I will refer. After you have drawn the coke into the furnace, you can save every particle. If you know the amount of coal which goes into the retorts, you can measure the coke which comes from the retorts, since there is no opportunity for it to get away. If you do not gather it in barrels, you have it on the floor, where you measure it. When you have to cart the coke out into the yard, and allow it to remain all winter in frosts and storms, with teams driving over it, breaking it up and packing it down, it is quite another matter.

Mr. Sherman—I suppose that Mr. Slater uses the same measure, and has probably measured some coke immediately from the mouthpiece. I will ask him how many bushels he gets per ton of coal, measuring it by the same measure employed by Mr. Stiness.

Mr. Slater—I can confirm what Mr. Stiness has said—that it will average 42 bushels, from the mouthpiece, of Westmoreland coal. I have made a number of trials at both stations, and have found that it would vary from 41½ to 43½, which would average 42.

Mr. Sherman—I understood you, some time ago, as estimating it at 36 bushels.

Mr. Slater—You understood me to say that it was 36 bushels figuring from our sales. As Mr. Stiness says, if you pile the coke up during the winter, and sell it during the following summer, there is more or less waste or shrinkage; and so during the year I do not think the average will be more than 36 bushels.

Mr. Coggshall—In using Allegheny coal I have measured the resultant coke from the ton of 2,240 pounds, using the United States standard measure, and have obtained a product of 41.8 bushels.

Mr. Stiness—I would like to hear Mr. Armington's explanation of what he calls "rank heresy."

Mr. Armington—I knew that you would coax me into this thing. We have had several little spats over this coke business, and never could quite

agree. The truth of the matter is, we have sealers of weights and measures around our place, and the result is that we have to sell an honest bushel of coke. There is one thing that strikes me, as being a little outside of my figures, in what Mr. Stiness says. He declares that if he could sell the coke right from the mouthpiece he could dispose of 27 bushels, but if he allows the carts to drive over it, and the snow to fall upon it, and the ice to mingle with it, he loses 6 bushels of the 27.

Mr. Stiness—Six out of 42 ; I corrected that.

Mr. Armington—I have heard all sorts of stories about the percentages of coke made, but I have never before heard of the influence of cart wheels upon it. There is a very singular thing in regard to some of the statements made here. In one instance I think it was stated that 12 bushels of coke were used out of the amount made. Ordinarily we weigh coke at 37 pounds to the bushel. If you take that as the standard you have 1,554 pounds of coke out of every ton of coal. The percentage that he would be using, taking 12 bushels at 37 pounds to the bushel, would be 34.44, with the percentage figured in pounds. And let me say right here that I think we are led astray in this Convention until we determine among ourselves just what we mean by the word "percentage." What I mean by percentage is pound for pound ; that it takes so many pounds of coke to carbonize so many pounds of coal ; not quantity, but weight, pound for pound. If you say that you use that number of bushels, your percentage is 28.57 of the amount of coke which you make. If you take the other statement, then you are using 37 per cent. of all that you make. My experience so far with the Dieterich furnace (and I do not make any great talk about it) is that we use 27 pounds of coke to carbonize 100 pounds of coal. According to your statement, you use 28.57 pounds. I was not in the room so as to hear Mr. Stedman's remarks, and I should not dare to make any figures based upon what he said ; but it seems to me that there is a great discrepancy about this talk, and there certainly is when you are talking about the number of pounds. My friend Mr. Thomas says that you can get 42 bushels of coke out of a ton of Westmoreland coal. So you can ; but we do not use Westmoreland coal ; we only use a certain percentage of it. Some use a very small percentage ; we use about 48 to 60 per cent. of Westmoreland coal, the balance being Virginia and cannel ; and of course we do not get any such high coke percentages. If our friend Stiness used West Virginia coal I should be able to understand about this cart-wheel business, because that coke is very friable and will fall to pieces almost of its own weight. I do certainly think that 6 bushels, which he thinks he loses somewhere from piling it up, ought, in part at least, to be charged to the furnace.

Mr. Stedman—I think that the introduction of weight measuring in coke tends to an unnecessary confusion. A certain number of bushels has a certain ratio to the whole number of bushels, and we can speak very intelligently and understandingly about the percentage of coke used when we say that we make so many bushels per ton and use so many bushels ; everybody can understand this without any figuring, and without resorting to any hypothetical weight of the coke. I endeavored some time ago in the Guild in Boston, to ascertain the weight of dry coke per bushel ; but the attempt resulted in hopeless confusion of figures. To get at the percentage by weight —to say that so many pounds of coke will carbonize 100 pounds of coal— any such attempt to get at a percentage is as if a grocer should undertake to get the percentage of molasses in a keg of nails. It does not seem to me that coke weights are relative things to estimate percentages by. The other method is simple, satisfactory, seen in a moment by anybody to whom you propound it ; and why we should want to adopt a foreign fashion of saying that so many pounds of coke will carbonize so many pounds of coal, I do not exactly understand ; because, in the first place, we are not united as to the number of pounds that a bushel will weigh. When you depart from estimating the percentage by measurement, you at once get into difficulty with regard to weights of different kinds of coke. Virginia coke will measure less, and weigh more per bushel. Cannel coke will weigh more and measure a great deal less per bushel. The different kinds of coal will produce different kinds of coke, so that each must have its own standard weight. But if we can agree upon a measurement of the different kinds of coal by their product of coke in bushels, per ton of coal, then it is very easy to convey to the mind of anybody just what we mean when we speak of the percentage of coke used. We should always speak of coke by bushels and not by weight.

Mr. Yorke—That is it exactly. I have been at a loss to know what gentlemen meant when speaking of the percentages of coke used. The way I should figure it would be this. If a certain quantity of coal would make 100 bushels coke, and I used 40 bushels of that coke as fuel, I would say that I used 40 per cent. of the coke made. Some gentleman might ask me whether it was by weight or by measure. I do not care which it is, it is 40 per cent. in either case. They might ask what percentage of coke will carbonize 100 pounds of coal ; but I do not understand that kind of figuring. If they will let me know the quantity of coke they use, of the quantity made, then I can understand them.

Mr. President—I believe that it is not improper for the presiding officer to add some remarks to the debate upon a paper which has been read. I would say with regard to this matter of coke, as corroboratory of what Mr. Thomas and Mr. Stiness have said, that the way in which we keep our figures in the Boston Gas Company is, that we estimate, after a very great number of experiments, in using good coal, that we get 42 bushels to the ton. We sell our coke partly by weight and partly by measure. People who come to the works to buy coke buy it by the bushel ; people to whom we sell coke in large quantities purchase it by the ton. Coke which we cannot use in our works and which has to be carried away for storage is paid for (for the carting) by the ton. So that in order to arrive at the percentage of what we are consuming about the retort house (and which does not go into the hands of the bookkeeper at all) we have to figure on a certain basis of weight per bushel of coke. If we estimate that we make 42 bushels of coke at 45 pounds to the bushel, and then subtract from the quantity thus arrived at the amount of coke which we have carted away and sold, partly by weight and partly by measure, the balance gives us the percentage that we have put into our fires. And the fact that, week in and week out, the percentage of coke which we have used about our fires runs from 38 to 40 per cent. of the quantity of coke made, seems to me very good proof that the estimate of production is pretty close. If it were much, or anything, out of the way we should find it out. Of course the weight of coke per bushel depends entirely upon how much water you see fit to put into it, and how long you allow it to dry after you put the water in. You can very easily make your coke weigh over 50 pounds to the bushel if you wish. Thoroughly quenched coke, after it has been allowed to dry, will weigh about 45 pounds to the bushel. Those figures prove themselves in the way in which they agree with the ordinary experience of gas managers in respect to the consumption of coke about the furnaces.

There is one other point which Mr. Nettleton has called up, to which I will refer, and that is as to furnaces. He suggests that the reason why Mr. Stedman's figures are so much better than the figures of any of the rest of us, is the fact that he has got his furnace under the stack. I would call his attention to the fact that Mr. Armington's furnace is under the stack, and that Mr. Armington's figures are no better than ours. As the Association of course know, we have been experimenting in this respect, and we have put the furnace in front of the stack, and behind the stack, and under the stack ; but we have never yet, to any great extent, gone into recuperation, nor have we done anything except that we tried first the Dieterich furnace ; and, as is well known, the heat of that furnace ran away with us. Since then we have experimented with furnaces in which we could control the heats. We now have a furnace in which we can have as high heats as we desire. We can take that furnace down when we want to. We have never been able to run our benches with much less than one-third of the quantity of coke produced. I think this has been the experience of Mr. Nettleton, and of all others in this country who have tried that furnace. Mr. Stedman has a furnace which he says he can heat with one-half of the coke that the rest of us are using. Whether that ability comes from superheating the primary air supply, or from the waste heat which is taken out of his furnace and added to the secondary air supply, is matter for experiment. That it can come from the fact that it is under the bench I do not think possible. I call Mr. Nettleton's attention to the fact that the most successful furnace which has yet been published in detailed drawings is that of Mr. Schilling, at Munich ; and his furnace is entirely outside of the stack—so that it would seem something more than the simple fact that the furnace is under the bench. The furnace which was put up for us last year under the bench heats the retorts very fairly, and as well as other furnaces ; but it does not do it with less coke than similar furnaces which are placed under the stack.

I think this debate has been beneficial to the Association. The paper which Mr. Stiness had given us is exactly the sort of paper which ought to come before the Association ; and there are a great many gentlemen who could present papers similar to it in interest if they would only take the trouble to do so. I hope they will be inspired by the example of Mr. Stiness, and will give us some of their figures next year.

Mr. Coggshall—Is it not because of using more steam in making the hydrogen that he gets better results ?

The President—In regard to that I would say that the German Association deputed a sub-committee to experiment on the matter of using steam under furnaces, to determine if they could save any fuel by doing so. My recollection of the results which they gave of those experiments is, they found that they got out of the steam about as much heat as it toook of fuel to decompose the steam. If they used the direct heat of the furnace to decompose the steam, nothing was gained by so doing ; but all the steam that can be decomposed by waste heat is probably a saving to the furnace fuel. In the furnace I have just spoken of (Dr. Schilling's furnace, at Munich) they decompose the steam by their waste heat. The flue, passing under the ash-pan the last thing before going up the chimney, enough water was decomposed to equal 70 per cent. by weight of the coke used. This shows the value attributed by them to the decomposition of steam in that manner.

I do not know whether Mr. Stedman has made any figures as to the quantity of water which he has decomposed by the waste product; if he has we would like to hear from him.

Mr. Stedman—We did not decompose any steam by the waste product. The waste product does not come in contact with the steam. We evaporate the water, and have to decompose it by using incandescent coke in the furnace proper. Of course, anybody who believes in the correlation of forces does not think that he can get more out of a thing than that thing contains, nor that the amount of energy used in decomposing steam would be exactly restored when the steam was burned. You do not gain any heat by it.

The President—The steam made from your waste heat products would be a gain in your fuel, would it not?

Mr. Stedman—Certainly

The President—The question asked is whether you know what weight of water you decompose by your waste product.

Mr. Stedman—In answering that I will say that we have sometimes evaporated as high as 90 pounds of water per hour, by careful measurement, in the ash-pan. In passing through the incandescent fuel, of course it takes heat from the fuel, and keeps down the tendency to clinker; and when it enters the combustion chamber it gives a large quantity of combustible gas, which is undiluted with nitrogen. In carrying a sufficient quantity of air to produce the carbonic oxide necessary for the supplementary supply, you carry with it a certain weight of nitrogen. The gas, as it passes from the furnace, is composed, of course, of the oxygen of the air which has united with carbon to produce carbonic oxide, and with the relative volume of nitrogen, which volume has simply to be raised to the temperature of the bench without any other useful effect than to expend a certain amount of fuel necessary to raise the temperature of the nitrogen to the temperature of the bench. Now, with the passage of the steam through there, you get a volume of combustible gas, which reduces the proportion of the amount of inert nitrogen very largely. It think it is quite possible to burn pound per pound of water and carbon. If that is the case, the proportion of inert nitrogen which does not get out, compelling you to use a larger amount of energy to raise it to the necessary temperature, is very much lower; and the more steam you can use in that way the greater the beneficial result will be. In that way the steam undoubtedly does a vast amount of good, beyond carrying off the heat from where it is not wanted to where it is wanted. Theoretically and practically it does that. To keep the heat down at the point of greatest intensity, so that you reduce the clinker to the minimum, and give you the combustible gases at a point where they have a directly useful effect, is of course a thing to be desired. It seems to me then theoretically and practically it is shown that, in raising the temperature of the bench, this steam is of very great value, beyond the simple keeping down of the intensity of the combustion in the coke chamber itself.

Mr. Armington—That theory is correct, and it has been carried out, as we very well know, by the Municipal Gas Light Company, in attempting to heat benches with nitrogen; but the general presence of the nitrogen, blown in there to raise that fuel to an incandescent state, made the gas so costly that it was impracticable to make the heat under those benches. They thought at one time that it was the cheapest thing they could use for heating the benches; but it was speedily found out the reverse was the case, and that coke fuel was the cheapest.

The President—Mr. Stedman, apparently, used as much water as he did coke.

Mr. Stedman—We did. On several days we made experiments to determine the amount of water that evaporated, and found that we were using just about pound for pound of water and coke. I believe that by superheating the steam—that is, by raising the heat of the primary air supply, and letting it combine with the steam just before the mingled product enters the grate bars—we can use a still larger amount of steam. We evaporated all of the steam that we could evaporate with the waste heat passing under the ash-pan in the way we had it. We propose, in the next setting, to heat the water that comes into the ash-pan first, so that it will be at the boiling point before going in there.

IN REFERENCE TO THE PRIZE PAPERS.

The Secretary—The two gentlemen presenting papers for the prize competition have expressed a wish to withdraw the same, and offer them as papers to be read in the regular manner. Mr. Thomas, as well as the gentlemen invited by him (Mr. T. G. Lansden and Capt. F. S. Benson) to assist in making the examination ordered by the Association, have no objection to offer against such withdrawal. The envelopes containing the names of the authors have been destroyed, and, if it be the pleasure of the Association to concur in this arrangement, I would move that it be so ordered.

This was agreed to.

The Association then adjourned, to re-convene the following day (Thursday, Feb. 21), at 10 A.M.

SECOND DAY—MORNING SESSION—FEB. 21.

The Association reassembled at the time appointed, proceedings being resumed as follows:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Mr. S. G. Stiness, Chairman of Committee on President's Address, presented the following report:

The committee to whom was referred the address of President Slater would report that they heartily commend the address as a whole, and feel that the Association has prospered under the judicious management of Mr. A. B. Slater. The committee recommend that a special committee be appointed to prepare suitable resolutions as to the deaths of our esteemed friends, Major G. Warren Dresser and Mr. William H. Price, said committee to report to the President; and would suggest that a suitable memorial be placed on a page of our record book. Your committee approve of the appointment of a committee to select subjects for examination and investigation in the work of practical gas manufacturing. Your committee further recommend that the Executive Committee be charged with selecting some special subject for experiment.

The report was adopted, and the recommendations therein contained agreed to.

[To be continued.]

[A Paper read before the Society of Gas Lighting.]

The Chamberlain Gas Process.

By MR. WILLIAM FARMER.

On Tuesday last, March 18, 1884, I called on Mr. Chamberlain at his experimental works, 65 West Fifteenth street, New York City, for the purpose of examining his process and obtaining all the particulars from him in regard to it.

In the first place he informed me that his gas was made from oil, water, and air, and that it could be put into the holder at a smaller cost than by any other process. The bench contains one retort, which is about 15 inches wide, 6 inches high, and 18 inches long, and is made of cast iron. On a shelf by the side of the bench he has two small tanks, one for holding oil and the other for holding water. A small pipe connects these tanks with the retort. There is only a small hydraulic main and washer between the retort and holder, and this, Mr. Chamberlain claims is all that is required to purify the gas.

When the retort is hot enough he turns the water and oil into the retort, and regulates the supply so that the proportion of water shall be to that of the oil as 1 is to 4. After he has made a certain amount of the oil and water gas he cuts of the oil and water, and commences to force atmospheric air into the retort till the proportion of oil gas in the holder shall be to that of the air as 1 is to 3; and this completes the process.

He informs me that the residuum from this process is a very valuable material for staining wood so that it resembles black walnut. I saw some of the doors at the works which he had stained with it, and they certainly did look very well.

The process has been tested in England, by Prof. E. Frankland, D.C.L., Ph.D., F.R.S.; by H. Sporne, of the City of London Gas Meter Inspector's Office; Henry Hutchinson, C.E., F.C.S., gas and chemical engineer, as well as several others; and they have all given very favorable reports of the process.

According to Mr. Hutchinson's report, he found, from a series of tests, that by the use of 10 gallons of refined petroleum and 2½ gallons of water, with the necessary quantity of air raised to a high temperature, 3,000 cubic feet of 18 or 20-candle gas, with a residnal product of tar equal to one-half gallon, can be made and relied upon. He also gives the following analysis of the gas, viz.:

Carbonic acid	2.1 per cent.
Oxygen	10.0 "
Illuminating gases	21.4 "
Non-illuminating gases	20.5 "
Nitrogen	46.0 "
Total	100.0 per cent.

He stated that the composition of the tar varies. One hundred parts of "thick tar" which was deposited in the hydraulic main contained—

Water	0.5 per cent.
Benzole	4.5 "
Burning and solvent naphtha	35.0 "
Lubricating oil	28.0 "
Pitch and coloring matter (stain)	32.0 "
Total	100.0 per cent.

The "thin tar," which is petroleum carried over chemically by the hot

gas, and slightly changed in composition by the heat, contains valuable coloring matters, and differs greatly in composition—

Benzole	0.75 per cent.
Benzoline	6.00 "
Burning oil	60.00 "
Lubricating oil	30.50 "
Paraffin oil and coloring matter	2.75 "
Total	100.00 per cent.

Mr. Hutchinson states that the gas does not contain sulphur nor sulphur compounds, nor naphthaline; that the gas will travel any distance, through large or small mains, without any deposit or condensation taking place at any temperature of the air varying from 20° below freezing point to the highest known temperature of the atmosphere; that it is the cheapest, as well as the brightest and purest gas that he has seen.

As Mr. Hutchinson has also given a very comical analysis of water gas, I thought I might as well give it, viz.:

Nitrogen	36 per cent. ! !
Hydrogen	25 per cent. !
Carbonic oxide	35 per cent.
Carbonic acid	4 per cent.

Now, I wonder where he picked up this water gas; for I have never seen such a specimen before. From an analysis of the water gas made by Prof. Wurtz, at the Municipal Gas Works, New York city, its constituents were found to be as follows:

Hydrogen	49.32 per cent.
Marsh gas	7.65 "
Carbonic oxide	37.97 "
Carbonic acid	0.14 "
Nitrogen	4.79 "
Oxygen	0.13 "
Total	100.00 per cent.

And this, I think, is a very fair average of the constituents of water gas.

As Mr. Chamberlain claims that he can obtain the refined petroleum, in bulk, at about 8 cents per gallon, I calculate that the cost of the commercial gas, when delivered in the holder, will be about as follows—when we do not take the labor and wear and tear into account:

10 gallons of refined oil, at 8 cents	80 cents.
2½ gallons of water	0 "
2 bushels of coke, at 8 cents	16 "
Total cost of materials	96 cents.
½ gallon of valuable residual, say	30 "
Total cost of material for 3,000 cubic feet	66 cents.

Hence, 1,000 cubic feet of the commercial gas will cost, in the holder, 22 cents, when the labor and wear and tear are not taken into consideration.

Gentlemen, is this to be the gas of the future or not?

Portland Cement.

The receipt of a copy of the Second Edition of Mr. Henry Faija's book, entitled "Portland Cement for Users," leads the London *Builder* to say that, owing to the extending use of this material in modern architectural and engineering constructions, any information respecting its chemical constitution and characteristics, the processes involved in its preparation, and the means of ascertaining its value as regards its strength, and its resistance to the effects of the atmosphere, fire or water, is of the highest importance.

Prior to the exhaustive and systematic tests conducted by Mr. Grant during the construction of the Metropolitan drainage works, contractors knew very little respecting the real qualities of Portland cement, as to its powers of resistance and durability, and it is not surprising that some of the original applications of the material were not successful; indeed, so numerous were failures that the material was discredited by many. Fortunately, Mr. Grant's experiments left no doubt as to the unquestionable value of the material when properly made and used. Mr. Faija's book is intended as a guide to the user of Portland cement. The author in the chapter on the weight of cement, as a test of its quality—usually taken at 112 pounds per striked bushel—points out that inasmuch as by various means of filling the measure a difference of from 10 to 15 per cent. in the weight of the material can be obtained with the same cement, and as the weight also varies with the degree of fineness of grinding, the weight alone cannot be considered a reliable datum from which to judge of the quality of a cement. It is suggested that the specific gravity might be taken as a guide to the extent of calcination which a cement has received; by this method the two elements of error mentioned as incidental to the weight standard of value are avoided.

The finer and more uniform a cement is ground the better; in properly made concrete or mortar each particle of sand and aggregate should be in contact with cement, and this desideratum can only be obtained when the cement is finely ground—and here it may be added that the degree of fineness of the sand also and its absolute purity are of equal importance; indeed, unless the same care is observed in selecting the sand for actual use, the chemical and crystallizing action of setting is never thoroughly effected. Mr. Grant specifies that Portland cement is to be gauged with three times its weight of dry sand which has passed through a sieve of 400, and been retained upon one of 900, meshes to the square inch.

Mr. Faija mentions a not generally known peculiarity attending the sifting of cement, viz., that when the cement is sifted, the part of the cement which does not pass through the meshes of the sieve has practically no setting power. Mr. Faija concludes from this that cement to be effective must be ground to an impalpable powder, and that granulation is ineffective.

The principal points to be considered in the process of gauging are, first, the careful manipulation of the materials, the proportion of water, and the form of briquette, or the form of cement-mould to be tested. The briquette should be of such a form that the strain under testing shall be entirely one of tension, and the briquette should be easily removable from the clips and mould. The proportion of water to the cement should be carefully arranged—from 17 per cent. to 18 per cent. of water is the usual quantity for cement—to be tested neat, or without sand. Slow-setting cements require less water than quick-setting ones. When the cement is mixed with sand, in the proportions of three to one, about 9 per cent. of water only is required. Before being placed in the mould, the cement should quickly, and with a minimum quantity of water, be brought into a pasty tenacious mass that will remain in any position it is beaten; by a little practice with a trowel this is easily done.

The cement may now be placed in the mould; the exclusion of the air may be assisted by gently tapping the sides of the mould.

The following are the visible changes which occur during the chemical action of the setting of the briquette after being withdrawn from the mould:

The water is exuded to the surface to be again absorbed, heat is now generated, resulting from the chemical action, and when this is completed the mould gradually cools to its normal temperature, and is then technically termed set. Of course, the more active the chemical action the higher the development of the heat; hence the quick-setting cement develops more heat in a given time than the slow-setting one.

The freedom of cement from liability to contract and expand may be ascertained by carefully examining the mould. If defective in these respects, fine hair-line cracks, or an alteration in the form of the mould, will be apparent. Portland cement should always be kept stacked for a considerable time before it is applied for constructional uses; if used too soon after being made, air is evolved from the cement, causing part of it to shell or flake off.

Formerly, Portland cements were usually tested seven days after being properly gauged; but owing to the fact that many cements have not attained their ultimate strength in that time, 28 days from the date of gauging has become the acknowledged period. The test briquettes are now made so as to have 1 square inch of sectional area subject to tensional strain, and not 1½ square inch as formerly.

Mr. Faija is not very sure as to the advisability of testing cement with sand, the plan adopted by Mr. Grant and the German Government, for the reason that sand of uniform character is difficult to obtain; but this reason is hardly sufficient to outweigh the advantages attending the method of testing the cement with sand, as this test is most decidedly superior in enabling the user to ascertain the quality of cement when applied. Moreover, many cements, although having an inferior cohesive strength, show a superior adhesive strength. The difficulty as to the sand might be overcome by users specifying pure white granite sand which will pass through a sieve of a given number of meshes.

Little is said in the volume before us of the chemistry of Portland cement. Although the exact and complete chemical action involved in the setting of cement has not as yet been defined, it is generally acknowledged to be a combination of the silica with the lime.

The following is an analysis of English (Thames) Portland cement taken in 1881 (Dingl. Polyt. J. 246-539):

Insoluble	S_1O_2	Al_2O_3	Fe_2O_3	CaO	MgO
2.894	21.307	6.593	5.386	61.459	0.449

So_3	K_2O	Na_2O
1.422	0.437	0.429 = 100.376

The principal constituents are the Silica S_1O_2 and the lime (calcium CaO), and the most active agent in the setting of Portland cement is the Calcic Silicate, S_1O_2, 2CaO. This, by contact with water, produces a substance crystallizing in hexagonal plates and playing the chief part in the hardening of the cement. A singular deficiency in Mr. Faija's book is the absence of information as to the adulteration of cement and the means of ascertaining if adulteration is practised.

The material most commonly used for adulterating Portland cement is blast-furnace slag dust. The presence of this substance in cement can be ascertained in three ways.

The specific gravity of Portland cement is 10 per cent. less than that of slag dust. Under the microscope Portland cement forms porous lava-like grey granules; slag dust, vitreous sharp-edged white or greenish granules. Pure Portland cement extemporaneously mixed with 33.3 per cent. of its own weight of water forms a liquid paste, whilst slag dust requires 40 per cent. to 45 per cent. So common has become the practice of adulterating cement with slag dust, Roman pozzolana, glass, flint, trass, etc., that the Society of German Cement Manufacturers has resolved to consider the sale of cement adulterated with more than 2 per cent. of foreign bodies as a fraud on the buyer, unless the nature of the mixture be made clearly known on sale and delivery.

The specific gravity of Portland cement may be taken as from 3 to 3.1. It is of a cold grey color. The darker it is the more calcination it has received, the lighter the color the less the calcination. According to Mr. Faija, "All over-clayed cements have a tendency to contract, never attain any very great strength, and are always quick-setting. An over-limed cement has a tendency to expand, has a tendency to blow, and is always slow-setting. The presence of too much lime is actually destructive."

Mr. Faija says that a good cement should possess the following properties:

1. Fineness—To be sufficiently fine to pass through a sieve having 625 holes to the square inch, and leave only 15 per cent. of residue when sifted through a sieve having 2,500 holes per square inch.

2. Weight, per striked bushel, to be not more than 116 pounds nor less than 112 pounds.

3. Specific gravity to be between 3.00 and 3.05.

4. Set—A pat made with a minimum quantity of water to set in not less than three hours, nor take more than six hours.

5. Tensile strength—Briquettes which have been placed in the water sixteen or seventeen hours after gauging to carry, at the expiration of seven days, 400 pounds per square inch without fracture, and at the expiration of twenty-eight days from gauging to have increased in strength at least 25 per cent.

6. Expansion or contraction—Pats left in the air or placed in water not to show cracks or other signs of deviation in form.

7. Color—The cement to be of a cold grey color, not to show change whether in air or water.

The chapter on the application of cement, although not sufficiently comprehensive, is of some value. Mr. Faija considers, and with truth, that the great enemy of cement is loam clay or dirt, and lays proper emphasis on the importance of having perfectly clean aggregates. The water should be added to the concrete gradually, whilst the mass is being continuously turned over with a spade, in order that all the constituents may be thoroughly well wetted. It is a mistake to add the water too quickly. Mr. Faija rightly condemns the custom of tipping the concrete into position from a height, seeing that when a barrowful of concrete is so tipped, the larger pieces of the aggregate fall to the ground first, the smaller pieces next, and last of all the mortar or cement, so that the aggregate and matrix become separated, and the value of the concrete is all but destroyed.

The use of concrete applied to walls, beams, or floors is not considered; but Mr. Faija has expressed his views in the instructive correspondence on this subject in these columns, by which the application has been well discussed, and a formula advanced by Mr. B. H. Thwaite. The chapter on the various forms of briquette testing-machines is useful, but not so comprehensive as one could have desired.

In the appendices are a valuable series of tables of tests on the strength of various cements, and also a series of analyses of various cements, clays, and limestones, and tables giving the specific gravities and adhesive powers of cement and building stones. To those who are not in possession of the papers and discussions on this subject contained in the Minutes of the Proceedings of the Institution of Civil Engineers, or of Mr. Reid's valuable treatise, we can recommend this little work. By the following process Portland cements are said to be rendered less subject to atmospheric influences: The cement materials should be allowed to remain in a cold solution of 1 part ferrous sulphate, in three parts of water, for twenty-four hours, after which they are dried in the air. The compound of iron hydroxide formed renders the cement firmer and harder, and less subject to atmospheric influence.

Of Interest to Patentees.

The Commissioner of Patents has decided that an inventor cannot make a valid claim including means not described, though the result be the same. Abandonment is not presumed if there is coupled with the invention a reservation of the right or purpose to claim such invention subsequently, and such reservation be filed; though each day's delay in filing tends to prove abandonment.

Special English Correspondence.

Communicated by Norton H. Humphrys.

London, March 10, 1884.

The first topic that presents itself for notice, at this period of the year, is the general state of the gas industry throughout the country. The English gas companies are bound, by their Parliamentary obligations, to issue a copy of their accounts at least once in each year, and made out according to a certain form prescribed by the "Gas and Water Facilities Act, 1871," and it is the general custom to issue these forms of account twice a year, for the six months ending June 30, and December 31, respectively. These statements of accounts are usually accompanied by a report from the directors on the state of the business, in which any matters that have occurred during the period, that are of vital importance to the interests of the undertaking, are commented upon and explained. Several of these accounts, (through the kindness of friends in different parts of the country) are now before me; and a perusal shows that gas affairs in England are in a very satisfactory condition. And this in spite of several unfavorable circumstances. The mild weather experienced during the months of November and December caused a diminution in the demand for gas, and also slackened the demand for coke. In addition to these drawbacks, the reduced value of sulphate of ammonia has been a serious loss. This residual product has usually contributed to income an amount equivalent to 2s. 3d., or that to 3s., per ton of coal used, according to circumstances; but during the six months in question the average price obtainable has been 20 to 30 per cent. lower; whereas about £20 per ton was formerly attainable, the quotations have ranged from £16 to £13. In the item of sulphate of ammonia there has been a diminution of income equivalent to about 9d. per ton of coal used, or nearly one penny per 1,000 cubic feet of gas. It says something for the vitality of the gas industry in England that, in spite of these adverse circumstances, and although the price of gas to the consumer has not been increased—indeed, in some instances reductions have been made in this respect—full dividends to the shareholders have been paid, with very few exceptions. In most cases the demand for gas is increasing, and the diminished consumption due to the mild weather has taken the form of a smaller increase than might have been expected, rather than an actual decrease as compared with the corresponding six months of 1882. Better prices are also obtainable for coke. At one time this product seemed to be of small value, and, in the case of large gas works, all sorts of expedients were obliged to be resorted to, to get rid of it even on absurdly cheap terms. But the public are beginning to appreciate its value as a fuel, both for household and technical purposes, partly by the natural order of things, and partly on account of its smokeless character; popular opinion having lately been very much agitated in regard to the evils of smoke in our large towns, due to the consumption of large quantities of coal. An increased demand for gas stoves is also noticeable, and also for gas appliances in connection with various technical processes.

For many years the companies supplying London with gas were regarded as being the best managed, and, in some sense, a pattern to their provinicial confreres. Although this has long ceased to be the fact, for many of the latter now come alongside the Metropolitan works in point of magnitude, at the same time being in no way inferior as regards engineering and management; still the two undertakings—the Gas Light and Coke Company, and the South Metropolitan Gas Company—which enjoy the honor of supplying gas to the city of London, are generally regarded with a prominent degree of interest. The former on account of its magnitude, its paid up capital being something like $50,000,000, is a striking object to gas engineers. Now, the South Metropolitan has always been noted for judicious and successful management, by means of which, together with the aid of fortunate circumstances, it is able to sell gas cheaper than its neighbor, while at the same time its shareholders receive the highest rate of dividend paid by any gas undertaking in the country.

The reports, and the half yearly meetings of the shareholders of these two companies respectively were, on this occasion, looked for with unusual eagerness, in consequence of the fact that terms of amalgamation had been agreed upon between the two, but the scheme was vetoed by the Board of Trade. There was some little expectation that the decision would not be submissively accepted by these companies, and the reports and meetings were looked forward to, as likely to be the means of letting out some indication of the spirit in which the ruling of the Board of Trade was received by them. It appears certain that the matter is to be allowed to fall through. The Gas Light and Coke Company say, "it is Kismet" with mild, dignified regret. The South Metropolitan appear to be well satisfied with the decision, rather than otherwise. Their deputy-chairman draws prominent attention to the fact that the question of amalgamation is finally settled; and the chairman, in his speech, shows that both the shareholders and consumers will be better off. So it appears a good thing for the South Metropolitan that the scheme has fallen through.

The paid-up capital—excluding premium capital not entitled to dividend—

of the Gas Light and Coke Company amounted, on December 31, 1883, to $52,301,525; their price for gas ranged from 74 to 68 cents, and the result of their six months working was a profit of $2,424,590, out of which a dividend of 11 per cent. was paid on the ordinary capital. In regard to the South Metropolitan Company the corresponding items are $10,693,745, 68 cents, $673,775, and 12 per cent. respectively. And now we must leave the London companies for the present.

"Cooper's Process" is attracting much attention in gas circles here. It consists in using "limed coal," instead of ordinary coal, for gas making. The limed coal is prepared by mixing with each ton of ordinary coal, preferably broken small, half a hundredweight of quicklime which has previously been slacked by the addition of its own weight of water. Thus each ton of coal receives half a hundredweight of lime and half a hundredweight of water. It is claimed that the limed coal will yield a much larger quantity of ammonia, and also diminish the sulphur given off with the gas, especially as regards those mysterious "sulphur compounds," which certain scientists say are so active in rotting leather, tarnishing gilding and bright metal, and, in the case of delicate persons, interfering with the respiratory organs. So that all gas companies who are restricted in the matter of the extent to which they may practice this mischief—*i. e.*, who are liable to penalty if more than a certain prescribed number of grains (usually 20) of sulphur are present per 100 cubic feet of gas—can, by the use of this process, avoid that extra expense of purification which is necessary under ordinary circumstances. It may be remarked, in passing, that local authorities when they purchase a gas works and undertake the gas supply of their town, are never prescribed in the matter of sulphur compounds; so they enjoy the privilege of making folks cough, and spoiling property, etc., *ad lib.* The increased yield of ammonia, and reduction in sulphur, would of course induce an all-round saving in the expense of purification. Several gas engineers have given this process a practical trial, and the opinions formed by experience with it vary a great deal, as indeed is likely to be the case with any new process. For we can scarcely expect that one rule is so elastic as to apply to all kinds of coal, carbonized in all sorts of ways. Perhaps further experience will show that it is advisable to apportion the lime and water used according to the information furnished by an analyses of the coal, or to the temperature of carbonization. It appears that the results claimed are attained in every case, but that they are attended with certain inconveniences which may be of sufficient importance to more than counterbalance the advantages. Amongst the alleged disadvantages of the process may be mentioned a deterioration of the coke. The lime acts as a flux in the furnace, and greatly increases the wear and tear of the firebars. Also the presence of visible small specks of lime in the coke diminishes its salable value. It is fair to add that the inventor claims an improved quality of coke, which burns clearer, and evolves no sulphurous fumes. Having given the present position, I wait the results of further experiments to be tried during the summer, before expressing any definite opinions on this subject.

This process affords an interesting example of the new style of advertizing, first introduced in connection with the electric light. Reverting, for a moment, to that erratic luminary, which unfortunately has proved so disastrous to that numerous class of people who, according to the proverb, are soon parted from their money, it will be remembered that the chief causes of the "electric light scare" were not results gained in practical working. They were not due, specially, to sanguine representations made by the would-be suppliers of the electric light. The principal cause was certain statements made by scientific men, apparently from the independent standpoint of pure scientific investigation. I say *apparently*, because subsequent events showed that some of the gentlemen who talked and lectured about the electric light were interested in electric patents.

Mr. Cooper has a partner who is well known, and deservedly so, as a skillful, practical chemist—Professor Wanklyn. While Mr. Cooper rarely speaks of his process in public, Professor Wanklyn has furnished himself with a budget of experimental results illustrative of the advantages of the process, and gone the round of the scientific societies, such as the Society of Arts, the Chemical Society, the Society of Chemical Industry, etc., reading before each body a paper which is an indirect advertisement of the process. Having alluded to this in connection with the electric light, it is right to add that neither Professor Wanklyn nor Mr. Cooper has promoted a company for working the process, or invited the public to subscribe to such an undertaking; in which respect they differ from many electricians. But it may be questioned whether any real advantage will result from the discussion of the process by the general scientific public, who, for the most part, are entirely ignorant as regards the practical details of gas making.

If there exists an English gas manager who does not know pretty well the general state of gas matters throughout the country, his lack of such knowledge is his own fault. To start with, there are three periodicals devoted to gas and water subjects. In addition to the "Gas Institute," which meets one a year, there are several district gas managers associations, some of which meet twice, and the others four times, a year. Full reports of all these meetings appear in the "*Gas Journal*," which is the original gas paper, the others being of comparatively recent growth. So that it would almost entirely occupy one's time to read all that is published in England on gas matters. Besides this, many of the learned societies discuss matters bearing more or less indirectly on our industry.

The spring meetings of the district associations have now commenced. The "Southern," "Midland," and "Manchester District" meetings are already events of the past, and two or three more meetings will be held in the course of the present month. The business of the first two named consisted mainly of an address, on gas matters generally, delivered by the respective presidents; while in the case of the "Manchester District," the customary inaugural address was followed by the reading of a paper entitled "The Lessons Taught Gas Managers by Colliers' Strikes," followed by a discussion. The author, Mr. Jones, of Chesterfield, resides in a coal producing district, and has, therefore, enjoyed good opportunities of acquiring information relative to his subject. Want of space forbids a further notice of this subject here, but I may return to it on a future occasion. In each case the meetings were well attended and there was every indication that the associations are in a satisfactory condition. There was a special feature in connection with the meeting of the Midland Association. After concluding their business, the members attended, by invitation, a meeting of the "Society of Chemical Industry," to hear a paper read by Mr. Charles Hunt—one of their own number, and engineer of the Windsor Street Gas Works of the Birmingham Corporation—on the subject of "Gaseous Fuel Applied to the Heating of Gas Retorts." This paper is a valuable contribution to the literature of the subject, as Mr. Hunt is in a position to speak from practical experience, having tried a large number of different plans, on a large scale, at the gas works under his charge. The greater portion of his remarks were directed to the subject of recuperation, which Mr. Hunt considers to be a more important *desideratum* than gaseous fuel. Indeed he appears to regard the latter only as a means to the former. By means of gaseous fuel, combined with continuous recuperation, he has been able to carbonize with an expenditure of only two hundredweight of fuel per ton of coal carbonized.

The following statistics, from a return prepared for the Government, on the state of the gas industry at the end of the year 1882, may be interesting. Total capital invested and paid up, $251,305,590; tons of coal carbonized, 7,280,757 tons; gas made, 72,583,343,400 cubic feet, equivalent to rather less than 10,000 cubic feet per ton. Gas accounted for, 66,613,943,900 cubic feet, or rather less than 9,200 cubic feet per ton, leaving a quantity equivalent to about 8¼ per cent. unaccounted for. It will be seen that the amount expended in capital is equivalent to about $34.50 per ton of coal carbonized. It should be stated that these returns apply only to statutory undertakings, which have obtained a special Act of Parliament. The expenses attending the obtaining of this special Act, however, are so large that small concerns, whose annual make does not exceed 8,000,000 to 10,000,000 cubic feet of gas, do not find it worth their while to obtain such, and they remain with only the powers attaching to ordinary trading companies. These returns may be taken, therefore, as only referring to gas works making more than 8,000,000 cubic feet per annum. They do not include the numerous small gas undertakings dotted about the country, making from the limit just named down to 2,000,000 or 3,000,000 cubic feet per annum, for the supply of villages and small towns having less than, say, 5,000 inhabitants.

Selling Coke by Measure or Weight.

This question has, quite recently, been occupying the attention of our English brethren; and as in this country, either side of the problem has no lack for supporters. A correspondent in a recent issue of the London *Journal* writes as follows:

"Some years ago one of our large customers for coke wished to buy by weight instead of by measure; and I called upon him and stated my reasons for believing that measurement afforded a more equitable standard for the sale of coke than weighing. My arguments were so far successful that I was permitted to charge for the coke by measure, on condition that it was also weighed, in order to afford a check on the carters. As the question of weighing coke has often cropped up, I had this particular quantity (about 3,500 bushels) most carefully weighed. We had at the time some coke which had accumulated during the previous winter, and of this we sent 2,268 bushels, which averaged exactly 41 pounds per bushel. We then sent 1,192 bushels of freshly made coke, and this showed an average of 33.75 pounds per bushel. In other words, the old coke weighed about 21½ per cent. more than the new; and yet it contained no more fuel. I submitted these figures to our customer, and have never since been asked to sell to him by weight, though he pays us about £2,000 per annum for coke.

"The two varieties of coke were on sale at the same time, and some of our customers were being supplied with one, while the remainder were being served with the other. If we had been sellers by weight, we should have

been charging a number of our customers 21½ per cent. more than we charged others for the same amount of fuel; or, to put the matter plainly, about 2½d. in every 1s. would have been paid by buyers of the old coke for water, which is not so scarce a commodity as to be worth such a price. Supposing a chemist were to sell his sponges by weight, and keep a large stock in his back yard unprotected from the weather; while, at the same time, he had another stock in his shop, kept nice and dry. What purchaser would care to buy by weight, unless he was sure of being supplied from the dry stock? If I were a purchaser of coke by weight, I should be very careful to refuse any that had been stored for even 24 hours during the winter, and so would our customers."

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Would Like to Get into Bridgeport, Conn.—Mr. Allen evidently wishes to duplicate his Poughkeepsie (New York) experience. Since the cessation of active opposition hostilities between his company (the Citizens) and the old Poughkeepsie Gas Light Company, Mr. Allen appears to have been enjoying a rather humdrum sort of a time, and is, judging from his latest move, anxious to enter into the opposition arena once more. Bridgeport, Conn., has been selected as the battle-ground, for which territory he seeks to obtain the right to build and operate a gas plant. The inevitable claims of great superiority, cheapness, etc., are brought forward as reasons why he should be allowed to obtain the grant sought, and is trying to convince the Bridgeport authorities that one foot of his patent gas will furnish twice the light afforded by an equal quantity of coal gas. The prices charged by the old Bridgeport Gas Light Company at the present time, are $2.05, $2.15, and $2.25 per 1,000 cubic feet, according to quantities of monthly consumption. It will be noted that the highest price charged by the Bridgeport Company is just equal to the rate at which all gas is sold in Poughkeepsie under the terms of the agreement, reached sometime last Fall, when the Poughkeepsie Company and Mr. Allen's Citizens Company agreed to bury the hatchet. Mr. Allen, we understand, offers to sell gas to Bridgeport's city buildings, etc., at $1.50 per 1,000; but, up to the time at which our advices are dated, had failed to say anything as to what rate would be charged to ordinary consumers. If Bridgeport's officials are wise, they will study the circumstances of the Poughkeepsie case; and, should this be done, we are strongly of the opinion that the present Bridgeport Gas Company will be allowed to pursue the "even tenor of its way."

Messrs. Park and White Re-elected.—On March 14, the Board of Trustees of the Philadelphia (Pa.) Gas Trust met for the purpose of electing officials for the ensuing year. Some opposition was developed towards Chief Engineer Park, as also against the re-election of Cashier White. Trustee Morris nominated Mr. P. T. Burtis, formerly superintendent of the Chicago Gas Light Company, for the position of Chief Engineer, and Trustee Stanton named Mr. William K. Park. A ballot resulted in the selection of the last-named gentleman; the vote being nine for Park and three for Burtis. Mr. White was chosen cashier by a vote of 7 to 5, his opponent being A. J. McCleary, nominated by Trustee Moore; Messrs. A. J. McCleary and Thomas Noble were then re-elected, by acclamation, to the officers of Controller and Registrar, respectively. No changes were made in the selection of subordinate officials.

The Equitable Gas Light Company (New York City) Holds Its Annual Meeting.—The first annual meeting of the stockholders of the above-named company was held on Tuesday, March 18. The following-named gentlemen were chosen to act as a board of directors for the ensuing year: Messrs. E. C. Benedict, Calvin S. Brice, Jacob Bertschmann, William H. Gebhard, E. N. Dickerson, Jr., R. M. C. Graham, E. Jerzmanowski, James R. Keene, Eugene Kelly, John Sloane, J. D. Vermilye, R. T. Wilson, and J. B. Wheeler. At the subsequent meeting of the directors, the following organization was effected: President, R. M. C. Graham; Vice-President, E. Jerzmanowski; Treasurer, Jacob D. Vermilye; Secretary, H. Keene; Executive Committee, Eugene Kelly, John Sloane and Jacob D. Vermilye.

A New Definition of the Word Anomaly.—A youngster recently inquired of his father what was meant by saying "an anomaly." "An anomly, my son, replied the fond parent, "is the man who pays his gas bill without referring to the company as a thief."

Fire in a Coal Mine.—A dispatch, dated Pittsburg, Pa., March 19, 1884, states, at noon of that day, a large mass of fire fell from the furnace at top of air shaft of B. F. Rafferty & Co.'s mine at Shaner station, on the Baltimore and Ohio Railroad. The mass lodged 150 feet below the surface, igniting the timbers and loose coal at the bottom. The fire spread rapidly, and in a few minutes the workings were filled with smoke. The 200 miners managed to reach the surface in safety, and at once commenced to battle with the flames. Their efforts at checking the progress of the conflagration did not make much headway, and application had to be sent to Pittsburgh for assistance.

Not Disposed to Give Up the Attempt.—Messrs. Potter and Hauk, who it will probably be remembered, made application a short time since to the Springfield (Ills.) City Council for the right to build and operate a gas works in that city, which privilege was denied. When the matter was being considered by the Council, certain propositions were submitted by the old Springfield Gas Company, (for account of same see Journal of February 16) the acceptance of which would be of great benefit to the people of the town. The Council agreed to the course proposed by the old company and, in return for the concessions offered, granted the Springfield Gas Company a ten year contract for supplying gas to the public buildings and to the street lamps, with the additional promise that the company should have the exclusive right to operate a gas works within the city's limits. It was thought that this ended the matter; but we are informed that the leading spirits in the opposition movement are disposed to make another attempt. They now say that they only want permission to lay gas pipes in the streets, and will risk their chances of getting a fair share of the public patronage; and were content to specify that no more than $1.50 per 1,000 cubic feet should ever be charged for a gas equal in illuminating power to 18 candles. They assert that the ten year contract made by the Common Council with the old company is a matter of indifference to them, for two reasons—first, because they were not particular as to whether they did any street lighting or not; secondly, they consider the grant *illegal*, and characterize it as one that cannot be enforced. They desire it to be understood that a new application will be made to the Springfield Council, and that an earnest attempt will be instituted to get the permission sought for.

These same gentlemen are now in control of the works at Bloomington, Ills., and while they are before the Springfield Council it might be in order to explain, as they present themselves in the pose of monopoly reformers, how it is that they are obliged to charge $2 per 1,000 in Bloomington for the same description of gas which it is proposed to sell in Springfield at $1.50. This explanation, if not of surpassing interest to the Springfield gas consumers, would undoubtedly be carefully perused by the Bloomington folks. If the Springfield Council have the best interests of the gas consuming portion of the population of their city at heart they will protect the franchises, property, and stock of the old Springfield Gas Light Company from the attacks of all opposition works schemes.

Increasing Its Stock.—A despatch, dated Frankfort, Ky., March 15, announces that the Kentucky State Senate have passed an act to amend the charter of the Louisville Gas Light Company. The measure provides for the increase of the capital stock of the corporation to $3,000,000, the additional stock to be sold at any time the directors may elect. The Louisville company, under the new law, is empowered to purchase and own the capital stock, buildings, apparatus and patents of any other gas company. The General Council is authorized to dispose of the shares now held by the city of Louisville, in the Louisville Gas Light Company, and is directed to place the proceeds of such sale in the hands of the Commissioners of the Sinking Fund, which body is to invest such money in sound securities or bonds, and the dividends received from these investments are to be expended in defraying the cost of lighting the streets and public buildings of the city. Upon the sale of the city's stock, the directors now representing the city in the board of direction of the Louisville Gas Company will be relieved, and the vacancies thus created are to be filled, by the ordinary stockholders, in the usual manner. The despatch does not state whether the bill has become a law.

It is no doubt a matter of general information that certain capitalists are at present engaged in the attempt to foist an opposition company (called the Citizens Gas Light Company) upon the city of Louisville; and in some quarters, when the action of the Kentucky Senate in passing the above measure was commented on, the interpretation placed upon the move appeared to be that the increased capitalization was intended as the first step towards absorbing the proposed Citizens Company. A reporter, attached to the Louisville *Commercial*, interviewed one of the leading men in the opposition company, and, in answer to the question as to whether consolidation between the two interests was to be effected, received an emphatically negative answer. The party interrogated did admit, however, that "in course of time, the old company might be forced out!" This gentleman must have great faith in the enterprise and ability of the "men behind the scenes" in the management of the proposed Citizens company; but, in our opinion the stockholders of the "Citizens" will have a lonesome time of it should they have to wait for dividends until the period" when the old company should be forced out."

Poor New Orleans!—New Orleans, La., has experienced all the troubles and delights attendant upon the varied phases of competition gas companies. But the citizens of that place are likely to be treated to another heroic dose of the same old medicine. No less than two sets of applicants are trying to obtain permission to establish gas works there at present—both being

equally desirious of giving a "purer, better, and cheaper light," to the gas consumers. Perhaps the intending "benefactors" could be induced to accept the terms granted to their predecessors not such a great while ago; but can the New Orleans Gas Light Company afford to make the purchase?

A Wealthy Scientist.—It is stated that the personal property of Sir William Siemens, the lately deceased scientist and inventor, amounts to upwards of $1,900,000.

The Goodwin Gas Stove and Meter Company.—The Goodwin Gas Stove and Meter Company, of Philadelphia, Pa., are to furnish the Gas Trust of that city with consumer's meters during 1884.

A Vicious Measure.—Here is a sample of the sort of legislation which our bright and honest legislators at Albany arrive at when dealing, in their law-making capacity, with the gas interest. On Monday, March 17, Senator Campbell introduced a bill which provides that it shall "be unlawful for any corporation engaged in the manufacture and sale of illuminating gas to charge a greater sum per 1,000 cubic feet for gas supplied to one consumer or one class of consumers than to other consumers; but it is provided that nothing in the act shall prevent any company charging State, city or village authorities less than that charged to the other consumers."

This looks very much to us as though Campbell had an idea that, should he wish the "sun to stand still," the Senate could so "provide."

More Electric Companies.—On March 17, articles of incorporation were filed, announcing the formation of the Globe Electric and Underground Conduit Company, capital $2,000,000; the Eastern Imperial Electric Light Company, capital $500,000; and the Chapman Electric Motor Company, capital $500,000—all of New York city.

A Farce Instead of an Investigation.—In our issue of February 16, we noted the fact that a proposition, introduced in the New York Legislature by Assemblyman Smith, to "investigate the process by which water gas for illuminating purposes is being manufactured in New York city and Brooklyn, the per cent. of profit paid by the consumers, and whether the use of such gas was dangerous to public health," failed of passage. The resolution, in modified form, was, a few days afterwards, brought up again. The modified measure instructed the State Board of Health to inquire into the poisonous nature of water gas; and the State Board deputed a sub-committee to make the requisite examination. The whole proceeding was in reality the veriest sort of a farce; the sub-committee did nothing but take the statements of those favorable to the water gas system, and evidently based their findings, in great measure, from the lot of trash gotten together by Professsor Raymond, Health Commissioner to the City of Brooklyn, when that gentleman was investigating the same subject, in response to a resolution passed by the Brooklyn Board of Aldermen, in the month of April, 1883. Professor Raymond did not then place himself upon record as to the greater poisonous or non-poisonous qualities of water gas over coal gas, but selected Professor Ira Remsen, of Baltimore, Md., as an expert, to render an opinion. Professor Remsen delivered himself, very much after the manner of Bunsby, of a statement chiefly remarkable for its lack of lucidity, although he did say, "It is possible that a fatal effect might be reached a few minutes earlier in the case of" (inhaling) "water gas than in that of coal gas." We understand that Professor Chandler was one of the experts invited by the sub-committee of the State Board during the recent investigation (!), to give testimony as to the merits of New York water gas. If the following, from the New York *Daily Times*, be reported correctly, the "Lowe Combination" should lose no time in securing Professor Chandler's services as a canvassing agent. Or may it be possible that Professor Chandler cannot be brought so readily to descant upon the virtues and merits of Pennsylvania water gas—when brought into comparison with the superlative excellencies of the New York city product? This is what the *Times* said:

"By request Professor Chandler gave his opinion on the question. Water gas, he said, contained three times as much poisonous carbonic oxide as coal-gas, and yet practically was no more dangerous. In cases of suffocation by it the victims would die just as surely from coal gas, but in a little longer time. The reason why there were more cases of suffocation from water gas than coal gas, was, Professor Chandler said, because in the places where suffocations usually occur, as in hotels and apartment houses, more water gas was used. Water gas was used by half the people in New York, especially in hotels and theatres, and nobody considered it dangerous except the coal gas companies. Professor Chandler further said that the reason why water gas had not been introduced into Europe was the difficulty of manufacturing it there, owing to a lack of anthracite coal. He added that although water gas was heavier than coal gas, it could not sink down and smother a person, because it was two-thirds lighter than air. He insisted that it had a decided odor, as every illuminating gas had, and that it furnished 50 per cent. more light than coal gas for the same price."

After this it will not be wondered at that the State Board reported to the Legislature in a strain sung to the same tune.

A Practical Illustration.—If the State Board of Health happened to be in session in New York city just 24 hours after they had concluded their so-called investigation they might have obtained some pretty conclusive evidence about the effectiveness of water gas as a deadly poison.

Private W. H. Walters, of Company K., Fifth Artillery, stationed at Fort Schuyler, in this State, visited New York city, on Tuesday, March 11, taking a room in the Kenwood House, corner of Bayard street and the Bowery. He went to bed along towards midnight, leaving word that he be awakened at 7 o'clock next morning. When the porter went to call him at the appointed time, he found the room filled with gas, and discovered Walters in an unconscious condition. Prompt measures were taken to relieve the sufferer and, after several hours of unremitting attention, he was restored to consciousness. While the Kenwood House people were trying to resuscitate Walters, First Sergeant Joseph Carter came in to pay his comrade a visit. Carter remained until Walters was out of danger, administered a sound lecture to his subordinate on the subject of blowing out the gas, and then went, directly across to the opposite corner, to the Van Dyke House, where he spoke about the narrow escape of his brother soldier from suffocation, and once more inveighed at the stupidity of a man who would blow out a bedroom gaslight. Carter engaged a sleeping apartment in the Van Dyke House, retiring at a late hour. The doors of the Van Dyke House are pierced with holes, which are covered, on the outside, with slides. When a sleeping apartment is occupied these slides are drawn back, in order that any odor of escaping gas may be quickly detected. The following morning the smell of gas attracted the attention of a porter attached to the hotel; he traced the escape to Carter's room and, looking through the supposed safety-contrivance, saw the inmate lying motionless on his bed. The door was locked, and entrance to the room was effected by climbing down a fire-escape at the rear of the hotel, and forcing open a window. Carter was beyond help; indeed the doctors summoned decided he had died some hours previous to the time discovery of his condition was made. Water gas is supplied to both of these hotels. In our issue of January 16, we suggested that the name of the Van Dyke House ought to be altered to that of "Hotel Dangerous."

Put Them Underground.—In the suit brought last November to compel the Brush Electric Illuminating Company to remove its poles and wires from the street surfaces in certain portions of New York city (decided in favor of defendants, as reported in last issue of Journal) a large amount of "expert" testimony was submitted by defendant in support of the position that the electric currents carried by its wires were not especially harmful or dangerous. Professor Morton contended particularly that no extra-hazard was incurred through overhead stringing of wires, and inclined to the belief that underground wires were more dangerous than were the aerial lines. G. Elliot Smith, Superintendent of the Fire Alarm Telegraph system of New York city, does not appear to share this view, he having, on March 18, handed to Mayor Edson a communication calling attention to damage to a number of fire-signal boxes in consequence of interference with the department's circuits by wires of the electric lighting companies. He asserts that the wires of the electric companies have been erected hastily and without attention to the interest of the Fire Department; and especially is this the case on Broadway. Instances are given where the electric light wires have destroyed 4 telephone instruments, 1 alarm gong and 18 street boxes. The central office relays and switches have been frequently damaged. The pecuniary loss was slight, but the possible consequences of a fire originating in the most dangerous district of the city, when the system was out of order, made it imperative that reform measures should be instituted. Superintendent Smith points out that the danger is not confined to a direct contact with a fire-alarm wire, but may be conveyed thereto through any other wire happening to be crossed at a remote point. He adds that the entire fire alarm system is endangered by the network of wires, and notes the same is liable to annihilation at any moment. Superintendent Smith wants the electric lighting wires placed underground, no matter what such disposition of them would exert on the lights. He recommends the enactment of proper ordinances, with certain regulations governing the placing of all outside wires and appliances of the light systems. He also advises that authority should be given to compel the electric light companies to discontinue the currents in hazardous periods, such as during the prevalence of high winds, rain storms, etc. [Professor Morton, in his argument, held that the danger occasioned by the passage of an electric current, diverted from its aerial wire roadway by a stream of water, and thus brought in contact with a human body, would be very trifling.]

A draft of an ordinance was submitted with Superintendent Smith's report. It specified that all electric lighting wires hereafter to be installed shall be placed underground. It also imposes regulations looking to the

safety of the fire-alarm wires where electric wires are already in existence. Mayor Edson forwarded the report and suggestions to the Board of Aldermen, and they referred the matters to Committee on Fire and Buildings. That speedy action should be taken was exemplified on the night of March 19. On that date the electric light wires at Broadway and Liberty streets made connection with a telephone wire leading to office of Fire Department Attorney, Equitable Building, and destroyed the whole apparatus. The telephone in office of Inspector Esterbrook was treated in a similar manner.

The fire-alarm system of New York city should not be exposed, for a single instant, to such disastrous possibilities.

THE USUAL RESULT.—The Consumer's Gas Light Company, of Chicago, Ills., adds another victim to the death list. On Friday, March 14, E. H. Gerster, a guest at the Palmer House, one of the most elegant hotels in that city, inhaled enough of the water gas product to make him a subject for a coroner's inquest.

SOMETHING FROM RICHMOND, VA.—Some time ago we announced that the City Council, of Richmond, Va., had instructed the Board of Public Interests of that city to make an investigation as to whether it would be advisable to make a reduction in the rates charged for gas, and also to ascertain the condition, cost, etc., of the gas manufacturing plant owned and operated by the city. The Board of Public Interests has handed in its report; action having been delayed by the Council, in reference to adopting the recommendations suggested by the investigators, we defer publishing the subject matter until the Council decides what steps shall be taken in the premises.

A LEGAL CONTEST ENDED.—A despatch to the Associated Press, dated Pittsburgh, Pa., March 26, announces that the bitterly contested legal battle among the companies desirous of supplying Pittsburgh with natural gas for fuel purposes was definitely determined on the date above given. Judge Stowe, who delivered the opinion, decides that the "Fuel Gas Company," of Allegheny county, has the exclusive right to supply the inhabitants of the City of Pittsburgh with heat to be developed either from natural or artificial gas until the specified company has paid five 8 per cent. dividends. We confess that the above information is somewhat mystifying—but, then, mystery always clings to the operations of the Associated Press. We would like to ask Mr. John H. McElroy, of the Pittsburgh Gas Company, to send us something in explanation of this decision.

TRYING TO RESTRAIN A TAX COLLECTOR.—The Consolidated Gas Company of Baltimore, Md., has brought suit for an injunction to restrain the tax collector from collecting some $19,000 which the city alleges is due from the Consolidated Company on account of taxes. The company claims exemption under an ordinance of the city exempting manufacturing plant from taxation. [On March 31, a decision adverse to the Company was rendered.]

CHEAPER GAS COAL FOR NEW YORK.—The welcome news has been announced that the shippers of standard qualities of gas coals to New York city and vicinity have agreed upon a material reduction in the rates at which deliveries are to be made during the year. Credit should be given the mine proprietors and carrying routes for the liberal reduction granted, as did the coal companies and transportation proprietors so wish, the former, or even higher figures, might be asked with the certain knowledge that such rates could be obtained. Westmoreland, Penn, and Ocean mine coals need no exposition of their merits as gas producers in these columns—their values are familiar to every gas engineer in the country. The rate fixed is $4.35 per ton, which will be noted as a concession of 40 cents per ton from the corresponding figure of 1883.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

"E.," in Rejoiner to "J. S.," Maintains His Original Position.

COLUMBUS, OHIO, March 20, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:—

The commendable feature of the communication, from your correspondent, "J. S.," published in last issue, is its brevity. Wish I could be as brief, and, at the same time, be explicit.

Our ideas of the duties of a scrubber probably do not differ greatly. We scrub gas, as I understand it, for the purpose of arresting any solid matter that may be mechanically suspended in the gas, and which, if permitted to remain, would obstruct the flow of gas through the mains, services, meters and burners. We wash gas with the same object in view, and expect, also, to absorb the ammonia, as well as a portion of the sulphuretted hydrogen and carbonic acid.

"J. S." would put all of his ammonia into his washer or scrubber, with a view of bringing it into intimate contact with carbonic acid.

Then the question is, can we more intimately mix the two impurities, after we have condensed the ammonia, than it was mixed before when the volume of ammonia was several hundred times greater? I think not.

Absorbing ammonia by water in the washer or scrubber cannot increase the quantity present, but, as practiced, reduces it.

In JOURNAL of February 16, "J. S." says, "There is nothing in the scrubber that will take up these impurities" (referring to CO_2 and SH_2) "but the water." This ascribes much virtue to water. But, on reading the whole sentence, it is evident it was not his intention to lay much stress on the value of water alone as a purifying agent.

Conditions and surroundings have much to do with increasing or diminishing the affinity of an acid for an alkali. My suggestion was, that under the conditions obtaining in the manufacture of coal gas, carbonic acid and ammonia did not readily unite. The proof of the proposition is presented to the eyes (or noses) of gas makers every day.

The two gases travel together through long lines of pipe and vessels to washer or scrubber, and, if an insufficient quantity of water is used to absorb all the ammonia, they will continue to travel together through purifiers, mains, meters, and pass out together through the burner; and careful tests will seldom fail to find both impurities present in coal gas. Carbonate of ammonium is formed, but more outside than in the washer.

The "Standard" (probably the best washer-scrubber in use) extracted but 11 per cent. of the carbonic acid passing; and yet I think it will not be claimed that the water flowing off contained no free ammonia.

When experimenting in this direction, I have reduced the quantity of water flowing into scrubber, and wet the lime in boxes almost to the consistency of mortar. The water in the lime would become thoroughly saturated with ammonia, to such a degree that the lid would have to remain off the box some hours before it would be possible for the workmen to remove the lime; and yet carbonic acid would be, or had been, passing that box.

That there is at least a weak affinity between CO_2 and NH_3 even under conditions existing in gas works, and that large quantities of carbonate of ammonium are formed, no one will deny. But that dousing the gas with cold water aids the combination, or that reducing the volume of ammonia by absorption in water will facilitate the bringing together of the molecules of the two compounds, I question.

That ammonia is a valuable agent for the removal of sulphuretted hydrogen, I know. That the value of ammonia in solution, as an agent for the removal of carbonic acid, is generally over-estimated, I believe.

Yours truly, E.

The Market for Gas Securities.

The market for New York city gas shares, while presenting nothing of unusual interest or importance, one way or the other, still exhibits symptoms of weakness, very small offerings of stock serving readily to depress prices, although investors have but little ground for complaint when comparing current figures with those ruling a twelve-month since. For matter of ready reference we will here reproduce the April 2d quotations of year 1883, bid prices alone being given. On that date we find Harlem at 97; Manhattan, 233; Metropolitan, 188; Mutual, 115; Municipal, 188; New York, 124. That prices during January and February of this year were beyond all reasonable bounds is conceded; and, we opine, the parties placing money in city gas securities a year ago have but little to complain of as regards the "staying-powers" of their purchases. It is our candid opinion that prevailing figures are yet too high, and incline to the belief that a further easement in values will take place. The lower rate for Manhattan gas can be attributed to the stock now being offered ex-dividend, paid April 1. In the above recapitulation of April 2, 1883 quotations, we failed to mention Northern gas—this stock was then bid for at 80. Opposition rumors have served some to weaken Northern shares; but we do not place much importance on the truth attaching to the various assertions.

Brooklyn gas shares are dull and generally lower. If all the statements now being carried about on the wings of dame rumor are even approximately correct, it would not be much of an exaggeration to say that Brooklyn will soon have a gas works to every 25,000 inhabitants—poor Brooklyn.

In out-of-town shares some see-sawing is noted in Consolidated Gas of Baltimore, quotation of March 28 placing it at 51 bid, offered at 51¼. We get a quotation, by way of Baltimore, for New Orleans gas bonds, 5 per cents, at 91½ offered at 92. This security appear to be largely dealt in at that point. A considerable straightening up in Citizens of Newark, N. J., is observed. Washington (D. C.) gas is steady to strong.

Majority and Minority Reports to be Submitted.

A special despatch to the New York Daily *Tribune*, from Boston, March 28, conveys the information that the legislative Committee on Manufactures came to a conclusion, on the above date, concerning the proposition that the statutes shall be so amended as to permit, in the cities and towns of Massachusetts, the manufacture of gas containing a greater proportion of carbonic oxide than ten per cent. The Committee is divided on the subject, and two reports will be submitted to the Legislature. The majority will be in favor of repealing the carbonic oxide percentage clause, and will also recommend the abolition of the statute limiting the capital stock of gas companies at $500,000. The minority report will dissent from the majority one on both the questions at issue.

Burning of a Cargo of American Oil.

The American ship, Aurora, having 2,000 cases of kerosene oil on board, was recently destroyed by fire at Calcutta. It was feared that the wind and tide would drive the burning oil to the crowded part of the river; but a fortunate change in direction of wind current prevented this result, and the flaming liquid was driven upon the beach.

The scene during the conflagration is reported as having been wonderful. The cases containing the oil exploded at varying intervals with reports like the rattle of musketry volleys, and a densely black smoke-cloud enveloped the town. This disaster has revived the scheme of establishing a subsidiary port for kerosene-carrying vessels at Port Canning, on the river Mutlah.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with W. B. Scott & co.,)
34 Pine Street, New York City.

April 2.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Central	$466,000	50	70	—
Equitable	2,000,000	100	97	100
Harlem	1,800,000	50	118	121
" Bonds	170,000		—	—
Manhattan	4,000,000	50	264	267
Metropolitan	2,500,000	100	223	—
" Bonds	658,000	—	107	110
Mutual	3,500,000	100	129	131
" Bonds	1,500,000	1000	104	106
Municipal	3,000,000	100	204	210
" Bonds	750,000		107	110
New York	4,000,000	100	149	151
Northern	125,000	50	70	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	130	133
Citizens	1,200,000	20	89	92
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	1,500,000	100	110	115
" Bonds	300,000		104	108
Peoples	1,000,000	10	65	69
" Bonds	290,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	89	91
Nassau	1,000,000	25	75	80
" Ctfs	700,000	1000	85	90
Williamsburgh	1,000,000	50	106	110
" Bonds	1,000,000	—	104	108
Richmond Co., S. I.	300,000	50	—	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	102	105
" " Bonds	124,000	—	105	10
Chicago Gas Co., Ills.			150	155
Cincinnati G. & C. Co.			178	180
Consolidated, Balt.			51	51¼
" Bonds			113½	114
Central, S. F., Cal.			50	—
Capital, Sacramento, Cal			57	—
Hartford, Conn	750,000	25	128	135
Jersey City	750,000	20	155	—
Laclede, St. Louis, Mo.	1,600,000	100	102	105
Montreal, Canada	2,000,000	100	186	187
New Haven, Conn		25	152	160
Oakland, Cal			29½	30
Peoples, Jersey City		—	102	105
" " Bonds			—	—
Paterson, N. J		25	96	99
Rochester, N. Y		50	70	80
Washington, D. C	2,000,000	20	185	200
Wilmington, Del		50	174	—
Yonkers		50	33	35
St. Louis, Missouri	600,000	50	255	256
San Francisco Gas Co.				50
San Francisco, Cal.			54	

WANTED,
A Draughtsman,

About 25 years of age, experienced in gas works machinery. Apply, stating experience and salary, to
595-1t Camden Iron Works, Camden, N. J.

Situation Wanted
As Draughtsman or Assistant in a Gas Works.

Fourteen years' practical experience in designing, erecting, and superintending works in England. Thoroughly acquainted with the manufacture and distribution in all details; testing for illuminating power, and manufacture of sulphate of ammonia. Testimonials and references on application. Age, 33 years. Address
595-1t "Assistant," care this Office.

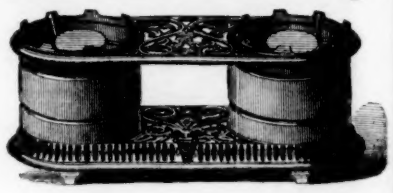
Position Wanted
As Superintendent of Gas Works,

By a competent man of many years' experience. Would take the management of any works making from two to fifty million feet per annnm. Address
595-1t "W. B.," care this Journal.

WANTED,
A Superintendent for Benzine and Coal Gas Works.

Output, about 100,000,000 feet per year. State salary wanted, and give references. Address
"Gas," care T. Field, 115 Worth Street, N. Y. City.

JAS. L. SHARP,



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